Bob Cooper's

MARCH 15 2008

SatFACTS

MONTHLY

Reporting on "The World" of satellite television in the Pacific and Asia

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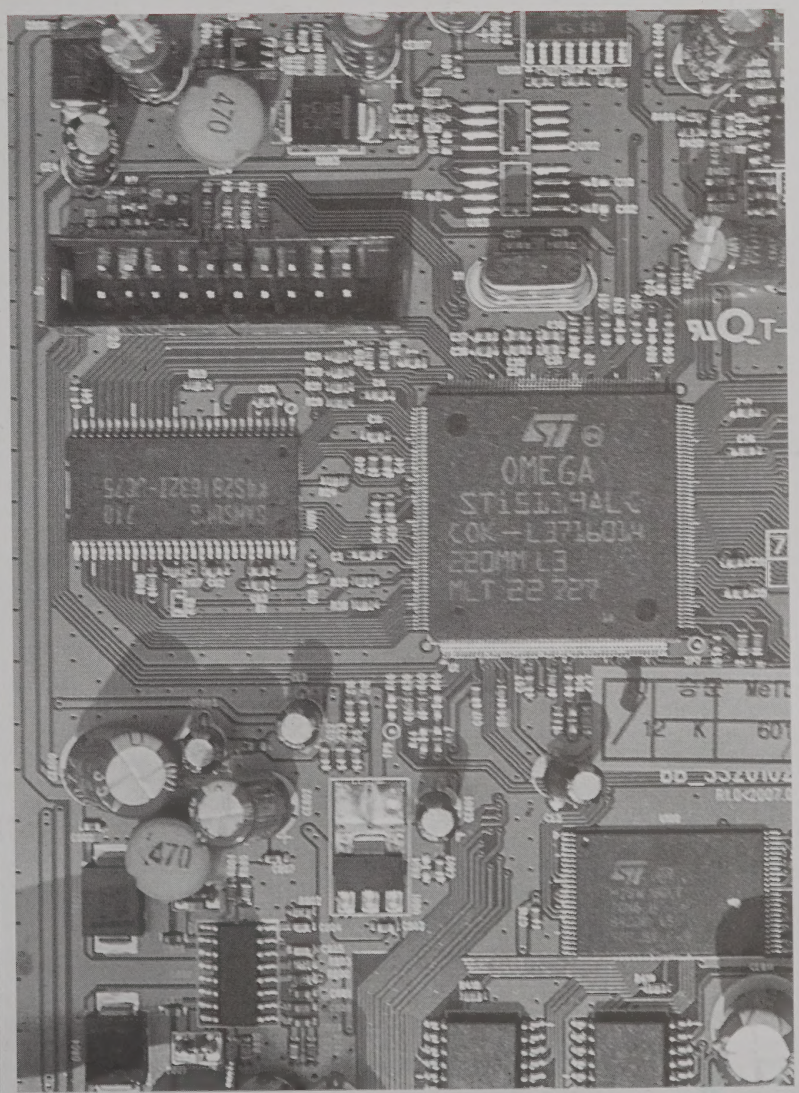

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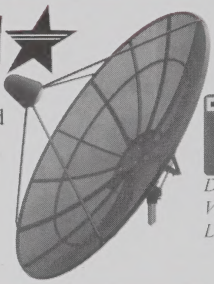

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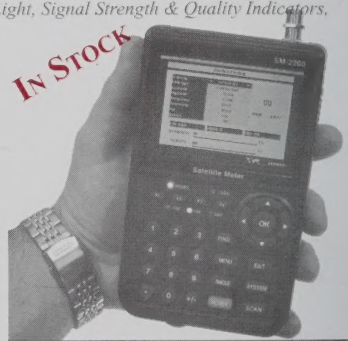

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ISSN 1174-0779

is published 12 times each year (on or about the 15th of each month) by Far North Cablevision, Ltd. This publication is dedicated to the premise that as we enter the 21st century, ancient 20th century notions concerning borders and boundaries no longer define a person's horizon. In the air, all around you, are microwave signals carrying messages of entertainment, information and education. These messages are available to anyone willing to install appropriate receiving equipment and, where applicable, pay a monthly or annual fee to receive the content of these messages in the privacy of their own home. Welcome to the 21st century - a world without borders, a world without boundaries.

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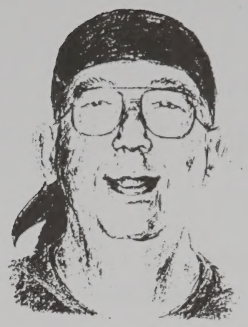

March 15, 2008

The Law Suit(s)

I remember, fondly, when this industry was all about technology - even those years when technology involved 'piracy' of CA transmissions (the MadMax or Rolf Deubel era). The satellite industry has now evolved into a 'legal era' - '*My attorney is smarter than your attorney and we will beat you in court*'.

This issue is significantly about law suits - first there is Fiji's SKY Pacific versus a local WiFi firm, with Sky Pacific claiming the WiFi guys are operating beyond the limits of their government granted permit - and creating wide spread interference to satellite reception. This one boils down to 'technical stuff' which, as we point out beginning on page 7, is apparently beyond the court's ability to assimilate. The second feature is far - far more complex. It involves NDS, the Rupert Murdoch controlled Israeli firm that is responsible for the NDS encryption system (used by Foxtel, SKY NZ and more recently Astro in Malaysia). On April 8th in a court in California NDS will be required to defend how, why and when it used its' superior conditional access (CA) skills to crack competitive CA systems for the purpose of putting a competitor out of business'.

The California case is brought against NDS by Charlie Ergen's DISH Network, which is claiming NDS deliberately used their significant skills to 'crack' the DISH Nagravision system encryption technique, and then - this is key - posted this information on several web sites allowing the piracy world to undermine the economic base of DISH. The case pivots around whether or not: (1) It was NDS that 'cracked' the DISH Nagra system, and, (2) arranged for the information to be 'posted' on web (piracy related) web sites. There is a third element: 'Did NDS do this with the deliberate purpose of putting financial pressure - or worse - on DISH'?

This comes down, in everyone's book, to a personal vendetta between DISH's Charlie Ergen and NDS's Rupert Murdoch. There was a time when Murdoch and Ergen had a 'deal'; Murdoch's DirecTV and Ergen's DISH would become one firm. But the agreement got hung up on 'which encryption system'. Murdoch of course favoured NDS while Ergen wanted Nagra (which he owns 50% of in the USA). This issue would kill the deal - both men were stubborn and they could not agree on the CA system. At this point in time DirecTV was badly violated by pirates and Nagra was essentially piracy-free. That was when, as the suit charges, Murdoch directed NDS in Israel to 'bust Nagra' and later to 'spread the information on how it works on piracy web sites'. Once that was done, and it was, Nagra came apart at the seams. The lawsuit charges NDS with busting the Nagra system, and then divulging the essential 'how-to-bust-it' on the web. NDS will of course deny this allegation but anyone who reads the affidavits (available on the web) must come to the conclusion that NDS did just this. Unable to force NDS into the amalgamation of DISH and DirecTV, the Israeli based firm used their professional skills in encryption to dissect the Nagra system and release the key information.

History suggests this technique is a regular part of how NDS functions. A man named Ray Adams, in charge of 'NDS Security' in Europe, allegedly wrote in an Email to his Israeli superiors, "The one hostage we carry into all of these deliberations is the weaknesses (sic) of our technology (access cards); so given that (our NDS) technology can be hacked very quickly, what do we do? Do we abandon recruitment of other satellite pirates and our customers [DirecTV] in a short space of time. Or, do we continue to recruit hackers? This gives us the time to get the technology correct... . "

NDS P1, and later P2 (two different versions used by USA's DirecTV) were hacked quickly. Adams (and others inside NDS) favoured hiring hackers to create a hack-proof version; P3, in the case of DirecTV. Alas, had NDS stopped after using hacker skills to develop P3 for DirecTV there would be no case. But as Adams is alleged to have written, "we need time to perfect our own technology and one way to get that time is to create chaos for Irdeto, NagraStar and other CA competitors." Read on (page 16 here).

In Volume 14 ◆ Number 163

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Departments

Programmer/Programming -p.2; Hardware/Equipment Update -p. 4; SatFACTS Digital Watch -p. 22; Supplemental Data -p. 24; With The Observers -p. 25

-On the cover-

Inside the blackboxCI - technology marches onward (page 12).

LETTERS

Licensing costs

"Http://www.mpegla.com/atsc/index.com contains license fee charges for STBs and TV sets. In the USA, $5 is the license fee charged each item for use of software created and owned by others but essential to the demodulation of ATSC DVB-T signals. If you allowed a 33.3% mark-up (on cost) for say the manufacturer, exporter, importer, distributor and retailer it comes to US$28 plus taxes; around 6 times the original license fee."

Bonner Martin, Bonlor Communication

MPEG-2 license fees are also covered in http://www.mpegla.com/M2. The first to announce DVB-T set top box pricing in New Zealand (mid-February) appears to be Noel Lemming quoting a retail/consumer price of NZ$549; "available late March". Of course the consumer now must acquire an HDMI/HDCP software operated display but perhaps after spending more than $3,000 the store will toss in the HDMI cable!

PORTObello One

"I have finished reading PORTObello (One) over the weekend. If life there (in the Turks and Caicos) was anything like the story describes, you are indeed lucky to have escaped alive. And I am looking forward to PORTObello-Two; I really enjoyed it, a good solid yarn with a story line easy to follow and the characters interesting. The tech references are fascinating and a bit scary!"

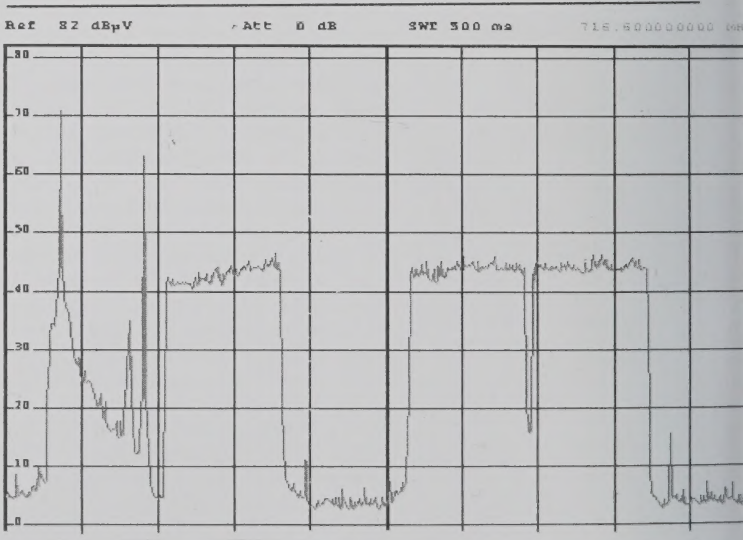
Ken Clark, General Manager Commercial, Fiji Television Limited

In PORTObello a device known as a 'digital telephone synthesiser' allows the user to tap or listen in to any telephone within the service area of the exchange, from any telephone (i.e.. no need to be in the exchange itself or a special 'room' established for monitoring calls). This leads to political intrigue, threatens the economic and government life of the Turks & Caicos Islands. Satellites, radio stations, newspaper publishers all come to bear on the story which ends as a cliff hanger (thereby awaiting the sequential restart in PORTObello-Two). Clark graciously, with wife Sally, agreed to 'proof read' the first book and offer critiques - which have been incorporated into the final text. See Garry Cratt letter, page 4 here.

PROGRAMMER PROGRAMMING PROMOTION UPDATE

MARCH 15, 2008

DTT transmitters were functional at 18 locations throughout New Zealand by February 22; Auckland (including single frequency infill repeater sites at Waiheke Island, Pine Hill, Sky Tower, Remuera), Te Aroha (and Hamilton infill), Kopukaira, Mt Erin (and Napier airport infill), Wharite, Kapiti, Wellington (and three infills), Christchurch and Dunedin. STBs are in (very) short supply - Zinwell expects a small shipment as you are reading these words although as of late February there had been no formal announcement by Freeview of *any* models being accepted by the accreditation process. Freeview's Steve Browning is quoted in the consumer press stating, "All DTT broadcasts of TVOne, TV2, TV3 will be in high-definition format (720P) ... although other Freeview channels will be in standard definition." Whaddon Selby-Adams, speaking for Zinwell, advises, "For recording purposes a viewer can readily feed HD and SD programs out to any recorder in SD format via component or composite connection. (For recording) the HDMI connection is not required." For consumers the BIG surprise will be when they decide to spend more than $500 for the HDMI equipped DTT STB and then learn, as Browning is quoted in consumer press, "*Viewers will also need a high definition television in order to see the difference in picture quality*".



Spectrum view from Christchurch; note two analogue carriers (left) and trio of DTT MCPC ranging from 17 to 25 dB below analogues.

Italian authorities have confiscated an estimated 1,000 NDS capable STBs imported from China. NDS owned Telepiu has until recently been immune from hackers which had destroyed the service prior to News Corp taking it over in 2003 (p. 16).

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Those damned numbers

"ABC (Australia) has modified its digital channelling and SBS has followed suit. However the changes are not uniformly working on all STB and digital tuner equipped TV sets. For example; a Topfield STB will not automatically accept the changes although a LG TV adopted without problems. Before and after: 2) ABC TV NSW has become 2) ABC 1; 20) ABC HDTV has become 20) ABC HDTV; 21) ABC2 has become 21) ABC1 (which is identical to 22); 22) ABC TV has become 22) ABC2; 23) ABC3 did not exist previously - currently same content as ABC1). 200) (ABC Dig Radio) and 201) ABC Dig Jazz have not changed. I had trouble loading the channels into the right channel allocations on the Topfield STB. Three attempts at rescanning the ABC's MCPC kept wrongly loading ABC2 into 21 and ABC1 onto 22. I found that deleting the original channels first, before scanning, made the channels load in the correct allocations. SBS has made similar changes."

Al, NSW

Attention New Zealand - you have all of these 'fun and games' still ahead of you - once you digest the $549 cost for the STB!

Luly and other eras ending

"I must say how sad I feel to read of the passing of Bob Luly. I met him several times in the early 1980s at various US satellite shows and was inspired by his innovations. To leave at such a young age is a real tragedy. I am also sad to read of the end of another era. SatFACTS has been instrumental in the development of our industry in the Pacific. I well know the huge effort involved in producing such a publication and the toll it can take. Is it too early to wish you an enjoyable retirement?"

Garry Cratt, Av-Comm Pty Ltd.

Retirement HELL! Coop will be 70 in April (the 10th should you be moved to send a birthday card!) and unfinished are four books. "Portobello" is a trilogy recounting in a totally fictional way life in the Caribbean's Turks & Caicos Islands in the era from 1990 onward. "Portobello-One" is totally completed, "two" is well underway. A fellow C-band pioneer, Larry James who currently lives in Arkansas, has been working on his own trilogy relating to the Turks & Caicos in the same era - book 3 for both will be a combined effort where the Turks & Caicos end up becoming a part of Cuba. Life begins at 70, or in Larry's case, 60; stay tuned!

HARDWARE EQUIPMENT PARTS UPDATE

MARCH 15, 2008

Tip of the iceberg department. Suppose you were purchasing Irdeto software programmed CA receivers from a name-brand manufacturer. Now suppose you were being 'invited' to sell out your business to another pay-TV operator who, while not being a direct competitor, was basically in the same market and could at any time become your competitor. *No names here.* Finally, suppose you discovered (shock and horror) your contract receiver supplier has been clandestinely co-loading the same CA software routine into your receivers that your would-be suitor uses - making it possible with a change in smartcards for your almost-competitor to grab control of your customer's receivers. Fantasy land? Read starting on page 16 here and plug in your own missing names.

Another victim? Germany's Premiere pay-TV service, which uses Swiss based Nagra CA smartcards and software, has been hit by large scale piracy. Of course it is a total coincidence that News Corp Europe in January purchased a 14.6% stake in Premiere for the not so modest sum of Euro 287 million amidst a flurry of business newspaper reports the pay-TV firm would switch from Nagra to NDS. Hey - if it worked once, twice, thrice - why not a fourth time???

New kid on the block - unfortunately *not our block.* AMC18 at 105W has a horrendous C-Band footprint extending from the Arctic Circle south to northern South America, Hawaii to past Bermuda with dBw levels of 40 down to 28 - but mostly in the high and medium 30s. That's 1.2m size C-Band dishes and the programming to be available (some already is) represents close to 100 channels for cable, SMATV and even private homes. See Lyngsat for the footprint - drooling on the screen is a hazard. Oh yes - American Samoa? Worth a shot!

Old kid on the web. Enthusiast John Finigan has rounded up all 13 issues of 'VHF Horizons' (July 1962 - July 1963) and is scanning them to a web home near you (http://www.nuvistor.org/vhf-horizons). He writes, "*It is too bad there weren't more issues - I have certainly enjoyed reading the ones that I came across 40 years later!*" Gracious! 40+ years - it seems like only yesterday when Russ Miller (W5HCX), Jim Kyle (K5JKX) and Coop (W5KHT) created this still much referenced very unique monthly publication. Thank you John Finigan - another bit of history preserved for the unwashed.

A reminder

April 2008 will be the LAST issue of SatFACTS Monthly. For those (a few thousand) who have active subscriptions beyond April, 'SatFACTS Extended" will be produced until your subscription has a natural point of expiration. No NEW subscriptions are being accepted and recent renewals (using credit cards) have been through April 2008 only. See bottom, left, here.

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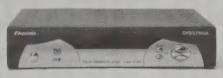

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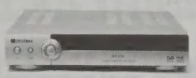

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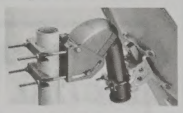

H-H Motor $85ea

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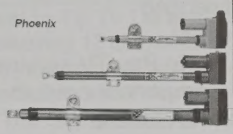

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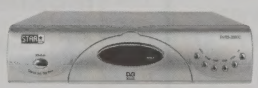

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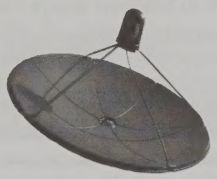

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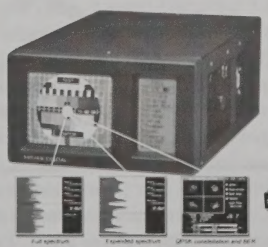

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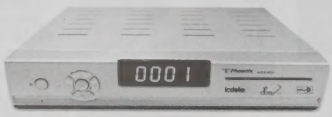

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A judicial review-

Fiji High Court ducks question of who is on first: Sky Pacific or WiFi?

SatFACTS for September 2004 (#121) featured Fiji TV's Ken Clark on the front cover wearing a pair of headphones and standing in front of several racks of MPEG-2 equipment newly installed for the launch of Fiji TV's Ku band service. Back in June, satellite operator New Skies had advised Fiji, "there are some technical problems with your contracted Ku band space". September announced a Dutch court had ruled in favour of Fiji TV; New Skies was legally obligated to find Ku band space (perhaps on NSS-5). That was the reason for Clark's wide smile - Fiji TV's long planned launch on satellite was finally going to happen.

The second and third feature reports were titled "UNwired is UNhealthy for Australian C-Band Reception" and "Technical Parameters of UNwired Terrestrial Service." Nobody realised at the time how closely these two seemingly unrelated developments would intertwine.

Under court order to find Fiji TV 'space' with coverage at least equal to the original promised Ku band transponders, New Skies would end up agreeing to compensate Fiji TV with cash credits and equipment to facilitate substituting a C-Band pair of transponders (on I-701) using a beam which would provide adequate signal and margin to C-Band dishes as small as 1.1m in Fiji proper. By late December (2004) the September-new Ku band uplink gear had been torn out and replaced with C-Band hardware. SatFACTS for January 2005 reported on the entire rebuild with a contract engineer from the states on the front cover pleased with his workmanship. Early tests of the Fiji TV while still FTA (they would become Nagra V2 in February) showed C-Band coverage from New Zealand to Solomons/PNG, Australia's eastern coast to Tahiti. It all looked "sweet".

Alas, then a firm initially granted permission to build a wireless network for Internet, I-PAC, back in 2001 appeared on the air in and around Suva. There were instant repercussions - many Fiji TV satellite sites within a circle as large as 10km around the initial I-PAC sites went dead. Which brings us back to the second and third features reported in SF#121; terrestrially generated C-Band interference. As SF reported first in #121 and then on a continuing basis for the next 18 months, a typical C-Band LNB (or LNBf) operating nearby to even a low power (as in 1 watt) UNwired 3.4/3.5/3.6 GHz transmitter would often simply 'overload'. The technical reasons, and some solutions, would appear in SatFACTS well into 2006, many of them pioneered by Australian Garry Cratt (Av-Comm Pty Ltd; in fact his 'solutions' have been on offer in a standing advertisement appearing in this issue on page 27).

A quick basic review. A standard LNB(f) provides massive signal gain (50 dB is not uncommon) and it does this over a wide frequency range (there are two standards here - 3.7 to 4.2 GHz and 3.4 to 4.2 GHz). There are two important parameters in the last sentence: Gain is the same as 'amplification' and 'wide frequency range' is the same as bandwidth. There is a third element seldom found in LNB specification sheets - 'Maximum output' (power/signal). An amplifier - any amplifier - is designed to operate through a range of input signal levels

The essence of the case

Sky Pacific is owned by Fiji TV Ltd and has operated a C-Band service delivering 12 channels of TV to Fiji and (more recently) the central Pacific from Tahiti Northwest to the Solomons. This service began in December 2004. The original business plan called for Ku-band service using a spot beam to come from I701 (180E). However, whether a mistake or deliberate on the part of Intelsat operator New Skies, after Fiji TV had installed the necessary uplink equipment for Ku (June-August 2004) and was ready to begin testing the service, the Ku space became unavailable. New Skies then offered Fiji TV C-Band space (4055 + 4095RHC) and while not admitting full responsibility for the Ku mix-up, did arrange for C-Band uplink equipment (and its installation) as 'compensation' to Fiji TV for the 'inconvenience' of the change. A license granted to Fiji TV for uplinking on Ku was 'verbally modified' to C-Band on 30 September 2004.

However, a wireless Internet provider (I-PAC) had been granted a license to use C-Band frequencies below 3.7 GHz in August 2001, prior to Fiji TV's 'emergency move' from Ku to C. I-PAC began actual transmissions in September 2005. From that date Fiji TV's C-Band reception systems have been subjected to 'interference' (caused by desensitisation of LNBs). Fiji TV believes the terms of their original Ku band service license should have also applied to their C-Band approval. The Ku terms appear to guarantee Fiji TV 'interference free operation' - an acknowledgement by government that future services licensed would not be allowed to interfere with the satellite reception service. If that condition did exist with the original Ku license, would it also apply to the C-Band 'rescue' approval?

The court was told I-PAC transmission sites are 'overpowered', radiating signals which by their strength create interference with Fiji TV LNBs over geographic areas larger than would normally occur. I-PAC denies this allegation and quickly points out that if the present power level of 3.5-3.7 GHz transmitters was reduced under court order, they would be forced to build additional repeater stations which would increase, not decrease, the areas now affected by LNB desensitisation.

The court found, in a 21 page document remarkable for its grasp of the issues, "*There are some real conflicts of technical evidence to be resolved. The final decision, although in keeping with law, might not arrive at what is in the best interests of all the parties. Accordingly, I find that Fiji TV did not have a legitimate expectation they would be issued with a C-Band licence on the same terms and conditions as the Ku-Band licence.*"

This leaves the matter unresolved, subject to the court's urging that a 'technically competent arbitrator' negotiate a settlement between the parties.

based upon the maximum levels anticipated from a satellite signal. The satellite, operating with between 5 and 80 watts maximum at a distance of 36,000 kilometres (or more) reaches the surface of the earth with pico-watts of power.

Now, the terrestrial 3.4/3.5/3.6 GHz transmitter, with 1 or 10 or 100 watts (of radiated power) and physically close to the satellite receiving dish system will end up going into the dish system electronics at 1,000 to 100,000 times the received signal from the satellite. At some threshold power level, as the terrestrial signal winds its way through the amplifier stages of the LNB, 'saturation' occurs. That is a fancy term for 'the LNB quits working' - which it does because the combination of the terrestrial high signal level and the amplification (gain) stages in the LNB add up to so much signal the LNB can no longer function.

The first step in curing terrestrial interference is to select or create a LNB designed for 'high output capability' - something Cratt has pioneered and used very successfully in New South Wales. For openers, this says do not select a LNB that by design covers the 3.4 to 4.2 GHz region because why would you want a model that is actually designed to amplify the 3.4 to 3.7 GHz region where the terrestrial transmitters operate. Yes, this says the correct choice should cover 3.7 to 4.2 and in fact as Fiji TV (our example here) operates in the 4055/4095 region, how about a LNB that is custom designed to cover only 4.0 to 4.2 GHz?

In the Fiji situation, local knowledge that an UNwired service was coming on the air (as they did in September 2005) and - AND - using the 3.4/3.5/3.6 GHz region was pretty well hidden. Additionally, had Fiji TV known they were coming, local knowledge concerning which LNB to select was also in short supply. Sydney was caught off guard when UNwired began there; Fiji would be no different.

Solutions?

There are possible technical fixes available here. But they require somebody to raise their hand to pay the costs involved. As Cratt has shown, a 'virtually UNwired proof' LNB can be built (he sells them) but because they are special order, small quantity items the cost is high; very high. On a case by case basis, buying just one, a few hundred dollars for a LNB that makes possible C-Band reception, where without it there is no reception, is manageable. But expand that to hundreds, potentially thousands of 'bullet proof' LNBs and - well, none of the affected parties in Fiji are raising their hands to volunteer.

In 'The High Court of Fiji' Judge R.J. Coventry in Judicial Review '0028 of 2006' released his decision January 14, 2008. The case is technically and legally complex and as of this writing (late February 2008) there is in fact no actual decision; Judge Coventry is recommending, "It might be that a mediator well versed in telecommunications could find a way of resolving (these matters)."

Problem one: While Fiji TV apparently held a government granted Ku-band uplink license (and companion government 'guarantee' of no allowable interference) in June 2004, there are court identified problems with what happened next.

Fiji-TV by mid-September was being coerced to agree to a C-Band service following a Dutch court ruling New Skies (satellites) could not simply 'walk away' from its original contracted agreement to supply suitable satellite space. Before accepting the New Skies offer, Fiji-TV communicated with the appropriate Government Minister asking if there would be any problems "if Fiji-TV opts for the C-band" (solution). After a further exchange, the Minister responded, "we see no difficulty in the activation of the C-Band delivery option." This would be the last formal communication between Fiji-TV and government on this matter until some time after I-Pac initiated their UNwired service (September 2005). At that point Fiji-TV had been operating the Sky Pacific service for 8 months. The judge notes, "It was, apparently, shortly after I-Pac started broadcasting that Fiji-TV raised the problem of interference."

Which brings us back to the matter of a formal license for Fiji-TV. Once the turmoil surrounding the initially planned Ku and then last minute C-Band changes, understandably the satellite broadcaster had many day to day technical and business considerations to deal with. But as Judge Coventry points out, a formal C-Band license had not been requested (nor issued) and it was November 2005 before Fiji-TV would get around to filing for this.

Judge Coventry writes, "It was two months after the interference started when Fiji-TV formally applied for the (C-Band) license". It would be May 2006 when the license was granted and when it was, Fiji-TV found "objectionable terms" included. The judge was prepared to overlook the tardy license application (in balance, I-Pac had their own licensing problems) but could not resist mentioning the possibility, "had Fiji-TV applied for their C-Band license during that nine months (i.e. before I-Pac began operating and interference became an issue) ... then it is quite possible that 'objectionable' terms might not have been included in their C-Band license."

Let us explore the judge's reasoning here. Sky Pacific is first and foremost a national service, Fiji first. Something in excess of 10,000 Fijian clients pay money each month for the 12 channel service. I-Pac as a wireless service provides anyone within radio-transmission range with something otherwise largely not available in the country; higher speeds. And then of course it provides portability, laptops, fixed PCs with a suitable antenna and connection which the local telecom cannot.

Sky Pacific like most pay-TV services attracts those who are poor but find the channel choice the best bargain to cash-starved homes. And those at the opposite end of the economic scale where the money is inconsequential to the 'status' Sky Pacific offers. I-Pac has a different appeal but the two share the upper end of the market, augmented by a generous slice from the middle-class business community who find the higher connection speeds and world-wide access indoctrinating. It is probable Judge Coventry is a subscriber to both; Sky Pacific and I-Pac, along with his circle of social and business acquaintances. In other words, in a country of some 800,000, there is within the business community and bureaucratic family a small but influential cadre of individuals who share position, wealth, and access to perks. This is not to suggest Judge Coventry was allowing his personal life to intrude on a 'wise decision' but to point out the obvious; any decision that encumbered Sky Pacific or I-Pac would subject him to endless complaints from the very people in who's company he chose to spend his time.

Problem two: I-Pac was first authorised to use the 3.4/3.5/3.6 GHz region in August 2001 but for a variety of reasons (involving a lack of suitable equipment for this frequency range until 2005) the service did not launch until September 2005. By some quirk in Fijian law, I-Pac's license termed them 'Primary' while the ultimate C-Band license granted in May 2006 would call Sky Pacific 'Secondary'. This classification would be the nexus of Sky Pacific's concern about 'objectionable terms'. The root of the 'primary' versus

'secondary' actually traces back to ITU (International Telecommunication Union) regulations, dating back to the late 1960s. But the Sky Pacific license, granted 8 months after I-Pac began operating, includes Clause 4.1 with the rather chilling phrase (from Sky Pacific's perspective): "Interference into C-Band receive terminals will be expected especially from terrestrial services operating close to the C-Band. The standard solution is the use of appropriate filters."

I-Pac Communications Limited, according to the judge, claimed they "have a properly issued licence and are operating in accordance with the terms of that licence and Telecommunication Regulations and therefore there should be no outcome from these proceedings which is to their detriment." That of course is one of several legal questions before Judge Coventry.

To that matter there are, as with Sky Pacific, some unanswered questions. There is the matter of transmission power; Sky Pacific believes the 3.4/3.5/3.6 GHz transmitters should be limited to 1-watt. But there is the claim of 200 watts. A technical question here, unanswered by the Judge's citations and rulings; is 1-watt the 'erp' (effective radiated power) or is that to be the maximum 'transmitter output power'? In which case any antenna 'gain' would enhance (increase) the 'radiated power' perhaps without any violation of the 1 watt limit - if in fact it actually exists.

Timing. I-Pac's original license grant in August 2001 included a requirement the service begin 'within six months'. They did not but they did receive a second six-month extension starting March 4, 2002. However it would be September 2005 before their first transmissions began. The judge notes, "there is a use it or lose it clause, but no action appears to have been taken by the Minister to enforce that."

The essence here is simply, that in Fiji, 'minor violations' in terms of licensing are not considered adequate reason to form a legal decision.

Problem three:

The terms of the late-applied-for Fiji-TV license establishes a number of 'objectionable conditions' on the TV broadcaster. In the courtroom, Fiji-TV argued they had every reason to expect a license for C-Band which essentially reflected the terms of their original Ku-Band license. The Minister in granting the various licences was here being directly attacked by the Fiji-TV argument. The judge had a different take on the wording of Fiji-TV.

He reflected, "Fiji-TV says that in the absence of a formal licence they could presume they were operating on the same terms and conditions as its original Ku-Band licence. They continue that the Telecommunications Regulations require that a transmitting station shall operate so as to not cause harmful interference to other stations (Regulation 109). Fiji TV stresses they are not causing interference to anyone. It is they who are suffering interference. The Minister rejects these arguments. Counsel on the Minister's behalf asserts that these are judicial review proceedings and that the Minister had done nothing other than comply with the law and his responsibilities and exercise properly the powers with which he is vested. Fiji-TV could not expect, when given the permission to operate in the C-Band, that any licence would necessarily be on the same terms as the (original) Ku licence. Counsel states that the Minister did take into account relevant matters and did not include any irrelevant ones." This brings us to a new area of contention - the role played in all of this by the Minister of Information, Communications and Media Relations. Had someone within the bureaucracy, government, erred in their handling of the licensing matter? A new problem for Judge Coventry who was, at the end of the day sitting in a quiet gathering of his friends, up to his neck with people such as 'The Minister'.

Problem four:

Fiji, the country, is on record as being against the earlier (and late 2007) general rules of the ITU. Approximately 12 countries, world-wide, have become 'footnotes' to a planet-wide agreement concerning the 3.4 to 4.2 GHz region. Australia, New Zealand are two others who have said, in effect, "We do not care what the rest of the world has agreed to do - we are going to assign 3.4 to 3.7 GHz for terrestrial use." For the remainder of nearly 200 countries, 3.4 to 3.7 would be a segment of the broader 3.4 to 4.2 satellite 'band'.

About which Judge Coventry writes, "The Minister says in granting Fiji-TV permission to operate a television service in the C-Band the Minister was departing from the standard requirements of the IT Regulations on the clear understanding it was a unique situation given Fiji TV's pressing dilemma. In those circumstances, the licence requirements which are complained about are standard ones in the telecommunications industry for these circumstances and are of the kind that Fiji -TV must have expected at the time they asked for and were granted permission to operate in the C-Band."

"I-Pac emphasise that they held their licence before Fiji-TV were given permission to operate in the C-Band. They allege that the real source of the problem is the failure of the Dutch Company, New Skies Satellites B.V., to live up to its contractual obligations to Fiji-TV, namely to provide fixed satellite services for Fiji TV in the Ku-Band. I-PAC says that once New Skies did this then Fiji-TV had to seek another band in which to broadcast the Sky Pacific Television Service. I-Pac continues that New Skies accepted they had not lived up to their contractual obligations to Fiji-TV and had negotiated a settlement with Fiji-TV to provide C-Band satellite facility and pay the latter compensation. I-Pac says that if for any reason the equipment, particularly the receptors (*meaning the dish + LNB + receiver*), which Fiji-TV had already purchased required any replacement or modification or more expensive ones has to be bought then the cost thereof should have been laid at New Skies door when a settlement of the contractual dispute was being negotiated."

In summation:

Judge Coventry writes, "Given what is known about the conflicts which occur in the C-Band between satellite and terrestrial broadcasters, in particular in relation to power output, it might well be that in seven or eight years time, quite stringent conditions might be imposed on I-Pac if it wishes to renew is licence."

His decision was no decision - urging the parties to find a 'competent telecommunications expert' to negotiate between the two parties. Judge Coventry recognised such negotiations had gone along prior to the court hearing, expressing his hope that after his consideration of all relevant facts, a reconsideration of 'where to from here?' might be possible.

In fact there have been two additional Fiji Government granted C-Band WiFi licenses granted, neither yet in operation. What Fiji-TV faces is an explosion in 3.4/3.5/3.6 GHz transmissions creating tiny but significant 'islands' of interference. Somebody is going to have to front up to what this costs - but the question remains, who?

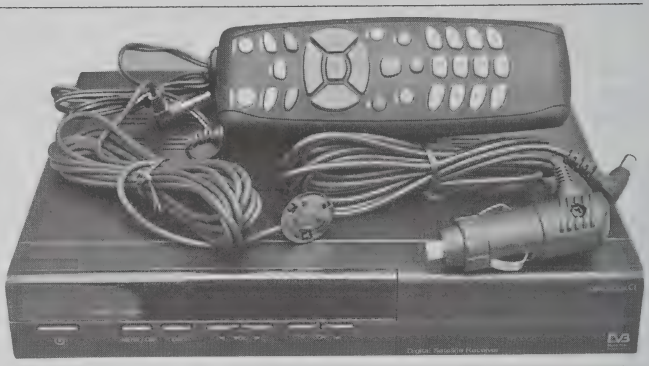
No - you have not quite seen them all!

blackboxCI
is, well .... different from the other kids

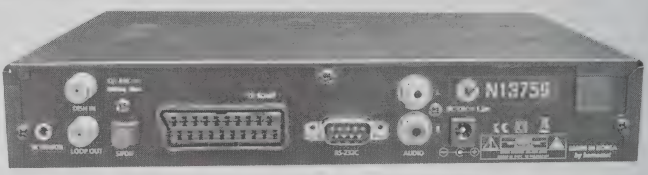
This could well be the most unusual satellite STB we have received for testing. The "blackboxCI" seems to have been designed by someone who went to a Chinese restaurant (possibly in Wenchow) and not speaking Mandarin ordered from the menu by numbers. "I'll have one of those, one of that, another of this ..." and so on. And when the dinner arrived it required two waiters with heaping trays to deliver the food from the kitchen.

This receiver will overwhelm you (well - it does us) simply because there are so many quirks, curves and twists in the software programming that a real enthusiast could spend weeks sorting out what it is really capable of doing. And that is only by following the manual (on a scale of Chinese to English, quite exceptional); who knows what secrets this STB really holds locked away below the normal manual and menu identified programming. Buying the "blackboxCI" will keep you amused and your spare time occupied for perhaps several weeks.

The name may not mean much to you (especially if you are under 40) but 'blackbox' as in 'Blackbox' was a secret code word for hacking of the giant AT&T telephone circuits back say in the 70s or so. Yes, this STB does have a standard PCMCIA card slot and no we did not try to load it with a CAM. We'll be several weeks yet just getting through the FTA options on offer.



"blackboxCI" is an unusual mixture of what an enthusiast might want and European connection demands. For example, it requires a SCART cable for video output! But, it is versatile.

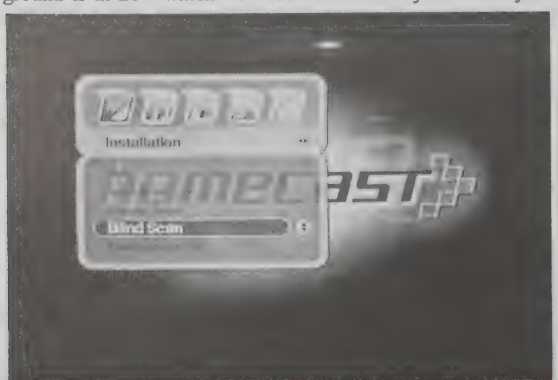


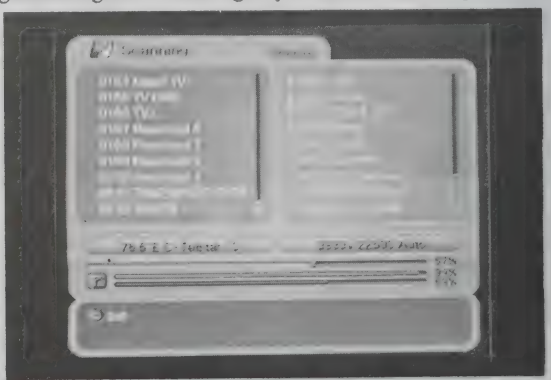
Not for us - anyhow

'blackboxCI' was originally designed for the European market; you can tell this from the manual's page 15, noting, "If you select Load Astra 1 or Load Hotbird, you can make (these the) default channels". There are two more strong clues: (1) The preloaded satellites as blackboxCI comes out of the carton, and, (2) On the rear deck you MUST use a SCART cable/socket connector to get video out. That's right - no handy RCA socket, no S-VHS, or video unless you have a SCART male socket feeding a cable that ends up in some quantity of RCA male connectors (video is on pin number 19 and video ground is in 21 - which will not be useful to you unless you have a 21pin SCART connector and cable). Oh yes, there is also no UHF modulator output (several readers just said "Oh sh--" and turned the page).

If you are still with us, there could be a good reason. This is a receiver for the adventure minded software-is-no-problem fans who really like to screw something up and then try to make it right again. Fortunately there is a 'Factory Default' sequence which we can advise does work because we like to play as well.

We suggested the written manual is 'quite exceptional' but that starts off with the assumption every manual ever written in Mandarin and translated ends up being pidgin English and gobble-de-gook. This one gets you "out of trouble" primarily





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Units of Measurements	dBm, dBmV, dBuV selectable by user
MPEG-2 Decoder	Yes, Embedded
Data-Logger	Yes, Also Captures MPEG picture to USB stick
Constellation Diagram	Yes, for QAM
Sat Finder	Yes, with NID detection
Upgradeable Software	Yes, by RS232 and USB 2.0
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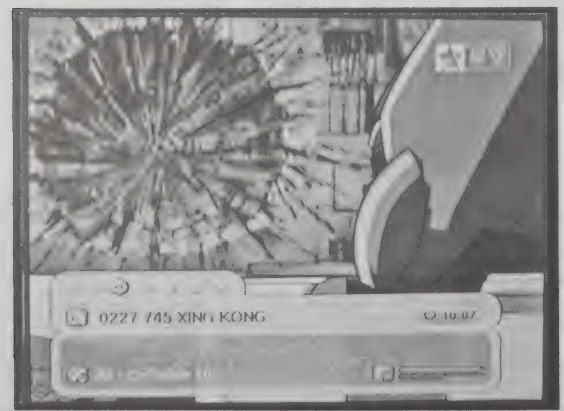
because you can read how to backtrack to the point where you stepped off the plank to the ocean below.

Results

Space is limited so we will come to the bottom line. It works, it is sensitive, and has lots of quirks. Blind Scan is a really nifty feature when it works properly - this one sort of does ("work well") but the ways it does not work well are mostly humours. For example we placed the receiver on the first satellite in the menu (Telsat 10) and with no further instruction asked it to Blind Search D1's Ku band by connecting it to a D1 horizontal only antenna probe. You can see the numbers here - pay particular attention to the frequencies shown! Yes, it found everything on D1's horizontal side (the only antenna connection we provided) but mysteriously gave the channels C-band frequencies. And yes we could actually load and watch any of these FTAs. Then we did nothing but change to a AS3S (Hz) antenna feed and tell it to Blind Search again. Again it found everything but mysteriously memorised all of these as being on Telstar 10.

The receiver obviously works very well (as a device to locate and demodulate quite weak SCPC and MCPC signals on C or Ku) - where it gets 'quirky' is when you ask it for the details of what it has done. Or *how* it did it!

Fortunately there is so much software inside the 'blackboxCI' after you do a blind or transponder or satellite search, a few minutes time with the on screen menu and you can re-sort and re-list what it found in some sequence that makes sense to you. Anyone who 'likes to have fun' with satellites will enjoy this receiver and once you have is mastered, well, it should give you many years of otherwise troublefree performance. Bottom line? Lots of fun for not many dollars.



Technical summary: blackboxCI

This is a high memory capacity (500 transponders, 2,500 programme channels FTA; 1,000 transponders, 4,000 programme channels CA) software driven 12V operated satellite STB featuring a "real" Blind Search routine.

Input frequency range: 950 - 2150 MHz
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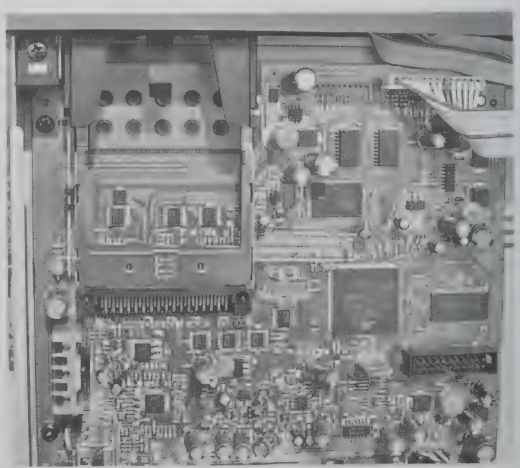
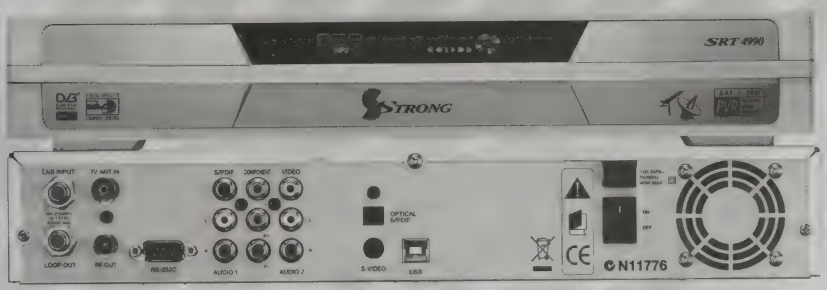
IF bandwidth: MCPC - 55 MHz; SCPC (5Mbps and below) 8 MHz.
LNB Powering: 13/18V DC, 0.5A max (overload protected)
DiSEqC: Version 1.2 (tone burst A/B)
Demodulation: QPSK
Symbol Rate range: 1 to 45 MBps (SCPC, MCPC)
Transport Stream: MPEG-2
Input rate: 15 MBps maximum
Video: MPEG-2 MP@ML
Audio: MPEG 1,2 audio layer 1 and 2
Video aspect ratio: 4:3 or 16:9
Video resolution: 720 x 576 (PAL) and 720x480 (NTSC)
Audio options: Stereo, dual channel mono, joint stereo, mono
Conditional Access: PCMCIA single slot common interface
Connectors -
Audio output - R and L RCA
Video - TV SCART (*) in RGB, CVBS, YUV (adapter required) + audio L and R through SCART
Serial Port: RS232C (sub) D-male type
S/PDIF Out: Optical connector (Bit stream out)
Infrared remote extender: cable and associated sensor
Powering-
Input voltage (through supply provided) 12-24V DC at 1.5 amp
Wall AC supply: 100-240V AC, 1.4 amp
Weight - 1.4kg
Price: Dealer (one off) A$158.00 including GST
Source: Melbourne Satellites as www.melbournesatellites.com.au
Telephone 61-3-9738 0888



Introducing SRT 4990



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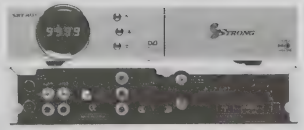
	SRT 4651X	 SRT 4653X	SRT 4654X	SRT 4658X
Blind Scan A powerful and convenient function that searches for those new frequencies and channels that are not in the factory default list stored in the unit's memory	X	X	X	X
USB 2.0 Connectivity For software upgrades and for playing/viewing MP3 and JPEG files stored on memory sticks (flash drives)	X	X	X	X
Component Video Outputs Offering a superior video quality on television sets equipped with such video input connections	X	X	X	X
CONAX CAS7 Embedded Conditional Access System card reader	**Upgradeable**	X	X	X
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April 8, 2008:

The BIG One - NDS in court for piracy!

Imagine for the moment you live in a country where the great and powerful covet another country's assets. But all attempts to acquire the coveted assets legally have failed. Plan B: 'Do something to make the coveted assets worthless (or worth less) and then proceed to acquire those assets in a depressed price fire sale'.

No, this is not about America and Iraq although the astute reader might notice some striking parallels. Nor is it about a country - unless you belong to that group who imagines large multi-national corporations to be 'just like a country' only privately owned.

Substitute 'NDS' for America and 'DISH Network' for Iraq and you are prepared for what follows. NDS, 72% (give or take a few floating percent) owned by News Corp, 37.5% (give or take a few floating percent) controlled by The Murdoch Family is being sued in Federal District Court (Central District, California) for the nice round figure of "one billion (US) dollars". DISH Network (controlled by C-Band pioneer Charlie Ergen) has brought the suit alleging NDS deliberately and covertly created encryption code 'breaks' (piracy) of the DISH Nagra format "for the purpose of devaluing DISH business assets".

This is the BIG one; an individual (Ergen) who has the assets to 'buy and sell Murdoch', with the tenacity of bulldog and the vigour of youth (he is 54), wants NDS (aka News Corp, aka The Murdochs) to pay for creating a 'business plan' deliberately designed to weaken DISH Network, if not put it out of business.

It's all 'in the cards'

The history (see right) of this case is remarkable because of the length of time it has stayed alive. That's the 'tenacity' part of Mr Ergen.

This involves an alleged attempt (which by the way was successful) to place a financial burden on a competitor. But that is the easy part to follow because from the NDS perspective any firm not owned, controlled and run by News Corp was (is) a competitor. At the top, when it all began in 1997, NDS was the smartcard supplier to US firm DirecTV and their system had been hacked quite without any 'professional' help, apparently by Canadians. Ten - eleven years ago, when all of this began, News Corp was just becoming established in the USA (largely because of the ownership of the Fox TV Network and Fox Films). Their political, bureaucracy influence would be post the election of President George W. Bush (2000).

DirecTV was owned at the time by Hughes (Aircraft), would be sold to General Motors (later sold again to News Corp and then sold one more time to a cable conglomerate). It was while DirecTV was having piracy problems (created by the "weakness in [NDS] technology" - see box to right under Ray Adams) that someone at News Corp created the concept of using a 'weak conditional access system' as a tool to allow News Corp to purchase a faltering pay-TV system provider. We'll return to this point because it is key to understanding the three edges of the sword.

A (brief) Chronology of **the** 'piracy' case

In summary:
"US broadcaster EchoStar Satellite Corp (DISH Network) and Nagrastar, the NDS rival that makes EchoStar's smartcards, are claiming that NDS, overwhelmed by piracy that threatened to destroy its business in the 1990s, instead turned its covert network against rival broadcasters." (Source: Neil Chenoweth, Australian Financial Review)

...

1994: DirecTV is first US Ku-Band DBS provider, owned by Hughes. They select NDS for encryption.
1996: EchoStar launches DISH Network as a direct competitor and selects Nagrastar for encryption.
1997: Canadian hackers crack DirecTV; similar hacks also occur with NDS systems in use in Europe.
1998: Evidence EchoStar will offer the court includes internal NDS emails dated in this year revealing, "The one hostage we carry into all of these deliberations is the weakness in our technology - our cards are even more vulnerable to attack than anyone realised before..." and as for hacking competitive CA systems, "(their) technology can be hacked very quickly...what (NDS Israel) need(s) is support - money!"
1999-2000: French pay TV operator Canal Plus, which created its own smartcards, South African card producer Irdeto suffer hacking (Foxtel in Australia), EchoStar alleges stemmed from deliberate NDS efforts to bust the competitors.
2002: Ray Adams, NDS security chief, resigned in July 2002 but *strangely* the hard drive for his laptop disappeared from his (London based) car. According to EchoStar allegations, they 'came into possession' of the hard drive's contents through Canadian hacker Plamen Donev. On the hard drive, more than 26,000 pages of confidential documents including a running exchange on NDS covert operations against EchoStar, DirecTV, Spanish Sogecable, Malaysian Astro, ITV. Those who would become involved (a partial list on page 20) were dealing in shipments of US dollar cash amounts in the region of $20,000 *daily*. A line appearing in the affidavit of one relatively small Canadian distributor of grey market cards, to be entered into the court if allowed, includes this statement:
"On or about November 4 (1998) my business (Avantec, Inc.) was raided by the Royal Canadian Mounted Police ('RCMP'). As a result of the raid, the RCMP seized satellite and non-satellite equipment, and, approximately (US)$5.5 million dollars in my bank accounts and safety deposit boxes belonging to me and several members of my family; and, approximately 12,000 new DirecTV Access Cards."
At US$200 each? Another $2.4 mil.

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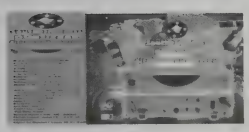

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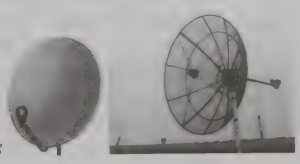

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Here is how that works.

Say you are Canal + (in France) and you have your own proprietary encryption system and your own smartcards. Now say someone - to fit this story plug in News Corp for 'someone' - wants/covets/demands something you own. That someone sees two attractive parts to what Canal + owns: (1) A pay TV system (actually two - including one in France and a companion in Italy), and, (2) A smartcard conditional access system that is a direct competitor to News Corp controlled NDS (headquartered in Israel).

And now say that in Italy - think of someone in the 1800s firing a cannot shot across the bow of your boat - there is a sudden appearance of smartcards which are piracy based - a third party has broken the card's EMM system, and upon investigation, Canal + determines the information to program cards to bust the Italian system now appears on the web. And that means anyone with a PC and a reasonable bit of programming experience could pay $5 for a blank unprogrammed card, stick it in their programmer and out comes a smartcard capable of hacking the Italian service. Now multiply that by 10,000, then 100,000, and finally 500,000. Someplace between 100,000 and 500,000 piracy cards in circulation the Italian pay-TV service rolls towards death.

Two not very good things have happened to Canal + in this scenario (which, by the way, is as it happened). First, their proprietary proud-to-be-French encryption system has been sliced and diced. "Italy today - France tomorrow!" That is the shot across the bow of their boat. Next, the asset value of the Italian pay-TV system owned and operated by Canal + has taken a major hit. Those who sliced and diced the Italian smartcard had not simply found a backdoor into the EMM; they took it apart bit by bit and emulated the original card. Canal + was, correctly, suspicious this was not the result of two teenagers in Germany; it had all of the marks of 'a professional'. Investigations at the highest level uncovered strong evidence (emails, web postings, even people who were now 'talking' of the exercise) linking back to - are you ready? - NDS in Israel.

We'll skip over what happened next except to point out the same thing was happening to DirecTV in the states, ITV in the UK and others. Canal + brought a lawsuit but wonder of all wonders - before it could get sequestered in court News Corp came along and 'rescued' Italian Telepiu by purchasing it from the French (and promptly converting the CA system to NDS-Israel). DirecTV had brought a similar charge against NDS (this one is slightly different - DirecTV was using an older NDS created CA system so whoever hacked this one was hacking a NDS system!) and they 'resolved' this one by News Corp buying a substantial interest into DirecTV. All of these happened at a 'depressed market price', apparently. Telepiu, DirecTV would have been worth much more if 'somebody' had not managed to slice and dice their smart cards. Of course 'we' do not know (for certain sure) 'who' was responsible for the card hacks. But Charlie Ergen's EchoStar (ECHOSTAR Satellite Corp et al v. NDS Group PLC et al.) believes they not only know how it happened, but have the necessary affidavits and records (significantly from Ray Adam's missing laptop hard drive) to send NDS down in flames. A reminder; EchoStar wants damages - a billion US would be a starting place.

To prove their charges against NDS Group PLC, EchoStar must tie together an entire series of events beginning with 1997-1998 and come forward to a point where as you read this Ergen's firm is within 90 days of totally replacing their entire universe of Nagra smartcards (announcements of this are already posted on the web; see http://www.bell.ca/support /PrsCSrvTV_DTH_CardSwap.page?tab=1).

Alas, the game is just starting. NDS Group PLC is raising a defence (we hesitate to label it a 'strong defence' because anyone who reads the affidavits - available as we go to press as www.crikey.com.au/Business/20080215 and follow the blue coloured links - will form their own opinion, as will the court) and is 'counter-suing' EchoStar; that is standard legal practice - the best defence is a strong offence and so on. EchoStar has requested a 'jury trial' which is somewhat unusual but not out of the question. "*Twelve men, tried and true....*" in the US of A would sit and work their way through thousands of pages of conflicting testimony looking for a thread that either points at NDS or (as is the procedure in a civil suit) "casts doubt as to the veracity of the charges". Interpretation? Twelve men (or women or a mixture of same, chosen more or less at random from a juror's pool) will sift through the documents, listen to the witnesses, and attempt to judge the truth in the charges. There is a billion dollars at stake here - and more important, the possible tarnishing of one Rupert Murdoch. There is every probability that if the trial becomes a serious threat to the man's reputation, someone will be nominated to 'take the fall'.

The name tangle

EchoStar's legal firms (two - from Houston, Texas and Los Angeles) are most probably working on a 'contingency' basis - the standard here is 30-40% of the award if they should win the case. Yes, that is a great deal of money; Rupert's money.

The 'name-game' is almost beyond comprehension. Hackers, pirates, individually often have web names, real names, and one to a dozen artificial names. Documents on file (the 100+ pages of affidavits) list them all in a time-sequence that almost defies logical comprehension. A partial list appears here on page 20 (it is not complete as such a list would fill pages).

The names will become a major hurdle for 'the jury' who will be expected to remember that NDS actively solicited the technical expertise of 'notorious hackers' (the phrase used by EchoStar), paying them large dollars (as the case will attempt to portray) to create 'hacks' of competitive-to-NDS encryption systems. Canal + would be one of these; Irdeto another, NagraStar yet a third. Oliver Kommerling is one such name; Christopher Tarnovsky another. NDS supplied several dozen (affidavit identified) with money and something none previously had; a measure of pseudo-legal protection by giving them 'professional level' recognition and the significant legal resources of NDS/News Corp behind which to hide their activities.

Oliver Kommerling is an especially interesting (to EchoStar) participant; he (with one Markus Kuhn) wrote something titled "Design Principals for Tamper Resistant Smart Cards". The title suggests something it is not - even today this has retained a position of being "the standard text on how to 'reverse engineer' a state-of-the-art smartcard by using certain techniques including, but not limited to, acid treatments, microscopic probes, laser cutting and ion beam manipulation". Kommerling's relationship with NDS had deteriorated when in April 2002 he provided a sworn affidavit to French firm Canal + detailing the methods used by the Israeli firm "to break the security system of Canal + and subsequently distribute that information to foster the satellite piracy of the Canal + system". This affidavit went into hibernation when News Corp negotiated an end to the Canal + lawsuit by purchasing their

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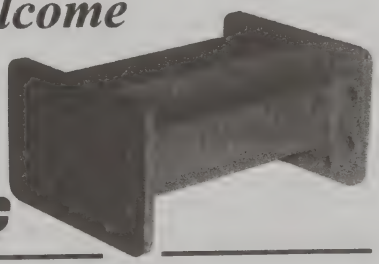

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piracy riddled Telepiu service. EchoStar has resurrected this highly damaging (to NDS) affidavit as a (minor) part of their own suit and it highlights the challenges faced by the NDS defence team. A similar statement from Christopher Tarnovsky implicating NDS with the deliberate hacking of Canal + also surfaced in the stopped Canal + suit against NDS.

But Canal +, ITV, Sergecable, Astro and others have no direct place in the instant suit although EchoStar will argue "there is a continuous ongoing 'pattern' of sponsoring piracy for the purpose of devaluing a competitor" in each situation. EchoStar's hack involved a carefully controlled card distribution system, originating through the web site of Allen Menard who allegedly played a major role in contacting and managing EchoStar 'card dealers' throughout the United States.

"The stinger" was a name given to a device used to reprogram cards from 'paid for' to 'hacked'. The 'stinger' had a limited number of 'shots' on board - NDS and Tarnovsky allegedly wanted assurance that they, not the dealer, would always be in control. When the 'clip was empty' the 'stinger' locked up and the dealer had to go back to Menard for a new device or 'refill'.

Money was changing hands here. Menard's dealers would send him money, he would allegedly retain a cut, and then forward the funds to Tarnovsky in Texas by wrapping $20,000 (or more) inside of common consumer home electronic cases - a CD player for example. The Texas address was a phoney - with automatic 'forward to' instructions at the post office. Tarnovsky was actually opening the CD players cum big bundles of cash at a home in California.

Postal authorities, alerted by the Canadian Mounted, became suspicious of Menard's shipments and US authorities began opening the shipments. Shortly thereafter agents appeared at Tarnovsky's California address where they were denied entry ("go get a search warrant") and told by NDS Exec John Norris, "Tarnovsky is an NDS employee, all of the equipment in the home is owned by NDS and officials are not to search the home or question Tarnovsky without NDS counsel being present." This was in 2001 and Rupert Murdoch was already in high gear rubbing shoulders with upper level US government officials, right up to the new President.

EchoStar further alleges, "NDS (would) provide protection for the NDS/Tarnovsky/Menard distribution network from potential RCMP (Royal Canadian Mounted Police) raids."

So it comes down to ...

NDS Group PLC has yet to formally be heard from. April 8th will see a court convening to hear motions (expected) from NDS to 'dismiss" the charges and suit. If the judge agrees the trial should go ahead, the next phase will be motions to drop some charges, modify others, to exclude some of the evidence before it is offered. And the jury selection.

"(EchoStar) believes that NDS Matam engineers, recruited and trained by Kommerling, also disassembled and analysed the extracted Codes from EchoStar Access Cards and explored methods to circumvent the security measures contained within EchoStar Access Cards. Once NDS obtained the encryption technology and related software code from the microprocessor, they replicated and modified the encryption and other software to interfere with the communication between the Access Card, microprocessor and Receiver, that, in the ordinary course of its operation, authenticates which DISH Network Programming services legitimate subscribers are entitled to view."

NDS: "EchoStar is long on inflammatory rhetoric but lacks any admissible evidence."

'The Players' - *some* of those named in affidavits

Ray Adams - London based head of NDS conditional access security; had his laptop hard drive stolen from car in May 2002 and dropped out of sight July 2002.

CT Electronics - Firm established by NDS for Tarnovsky as a 'cover' for his receiving and shipping hardware and smartcards.

Dave Dawson - Alleged EchoStar piracy card dealer

Discount Satellite - Edmondton (Alberta) firm raided by RCMP charging sales of EchoStar piracy cards

Plamen Donev - Director/Technical Advisor for NDS (aka Pluto); possible source of Ray Adams hard drive.

Boris Floricic - German hacker (nick name Tron), known for creating research papers on reverse engineering smartcards; found dangling from a tree under very suspicious circumstances involving him being unwilling to join the NDS piracy group.

Stanley Frost - Alleged EchoStar piracy card dealer

'Mike George' - Alias used by Christopher Tarnovsky at urging of NDS employee John Norris while attending (SBCA) satellite trade shows.

Chad M. Hagan - Lead attorney for EchoStar

Reuven Hasack - NDS Israel laboratory engineer, later revealed to be Head of NDS Security, Israel

Oliver (Alex) Kommerling - Major NDS hired pirate who turned against them in 2002.

Giles Kaehlin - Head of security for Canal +, France

Kudelski Group - Owner/operator of Swiss based Nagra(Star) conditional access system.

John Luyando - NDS employee interfacing between Israel and NDS California (Norris and Tarnovsky)

Matam Centre - NDS encryption research facility; Israel

Allen Menard (aka Kelly and many more) - Canadian hacker web site operator (www.dr7.com) NDS used to distribute hacked codes of EchoStar's DISH Network.

Mervin Main - Hired by Menard to help establish and operate the EchoStar piracy card network.

Vesselin Nedeltchev - aka Vesco

NDS/Tarnovsky/Menard - Descriptive term used by EchoStar in citing the sequence of hack information to creation of hacker cards to distribution of EchoStar hacked cards or data.

NiPpEr - Secret code word buried by NagraStar inside of ROM Code; Tarnovsky used this phrase when announcing on Menard's web site the cracking of EchoStar - a 'wet towel in the face' to NagraStar leaving no doubt in their mind the entire code had been cracked, right down to spitting back out their secret file name.

John Norris - NDS executive in California, associated with Tarnovsky; later revealed to be head of NDS Security, USA.

P1 code - Original DirecTV CA smartcards created by NDS; all replaced at DirecTV's expense by July 1997.

P2 code - Second generation DirecTV card, reportedly hacked by August 1997.

Regency Audio - Firm name established by Menard to disguise his shipments of cash-hidden-inside-electronics to Tarnovsky in Texas.

Sean Quinn (aka Hitec) - Alleged EchoStar piracy card dealer.

Andre Sergei (aka koin, Koinvizion) - Alleged EchoStar piracy card dealer.

Reginald Scullion - Alleged source for details on Menard's NDS support structure; (Avantec, Inc.).

Cynthia A. Ricketts - Additional counsel for EchoStar

Martin Paul Stewart aka Marty Mullen - Hacker

Christopher (Mike) Tarnovsky (aka shrimp, nipper clauz) - Alleged to be the hacker who broke the original DirecTV NDS CA system; went to work for NDS.

X-Factor Design - firm operated by Allen Menard to distribute EchoStar cards and updates

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	Ch Nepal	3626/1524V	1	3/4	15(.556)	New 03/03, FTA
	Mahar mux	3600/1550H	11TV, 1 rad	3/4	26(.667)	Thai + Indian services, FTA inc Vibe TV, Sindh TV
	RR Sat mux	3551/1600H	8TV,10 radio	3/4	13(.333)	3TV, 5radio inc Hellas TV Greece FTA
	TVK Cambodia	3448/1702H	1TV	1/2	6(.312)	**FTA**
	TARBS/Th5	3480/1670H	12 TV+radio	2/3	26(.667)	**3FTA** TV5, VTV4, ATN Bangla
	Thai Global	3425/1725V	up to 7?	2/3	27(.500)	FTA (reaches SE Australia)
InSat 2E/83	**ETV mux**	4005/1145V	6+ TV	3/4	27(.000)	Several ETV now here, wide beam
	Hyd Dig 2E	3910/1240V	1	3/4	5(.000)	SCPC, OK E. Aust wide beam
	Kairali TV	3699/1451V	1	3/4	3(.184)	SCPC, OK E. Aust wide beam
	Indian mux	3643/1507V	3	3/4	19(.531)	corrections 12/02
	Sky Bangla	3430/1720V	1TV	3/4	6(.000)	New - November 2002
As2/100.5E	**Guangdong TV**	4075/1075H	1TV + radio	3/4	6(.000)	July 04 FTA
	Euro Bouqt	4000/1150H	5TV, 19 radio	3/4	28(.125)	FTA TV + radio, LUXE TV HD here
	SatLink	3960/1190H	3TV	3/4	27(.500)	(Real Madrid left July 2007)
	Reuters News	3905/1245H	1TV	3/4	4(.000)	Was 3923H, sometimes **FTA**
	WorldNet-Africa	3880/1270H	4+/18radio	1/2	20(.400)	FTA, multiple audio services V2360, A2320
	APTN Asia	3799/1351H	1	3/4	5(.632)	Sometimes **FTA**, also 3895Vt
	Reuters/Sing.	3775/1375H	1	3/4	5(.631)	**FTA** & CA
	Macau MUX	4148/1002V	5TV	3/4	11(.850)	5 chs TV, FTA, some tests
	Dubai MUX	4020/1430V	4+, radio	3/4	27(.500)	FTA , Dubai Sports Ch some English, soccer
	Russian/Israel	3832/1318V	up to 4 video	3/4	7(.271)	Two Israel, two Russian (REN-TV)
	ArabSat#2	3820/1330V	8+ video?	3/4	27(.500)	11 FTA here, Kuwait Space new 02/08
	Trace TV	3792/1358V	1	3/4	2(.400)	new here Dec 2004, Euro-French music videos
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Express2/103E	**Various-tests**	3675/1475R	2	3/4	4(.340)	Now loaded from 96.5E, svrl below 3900 all RHC
As3S/105E	**Chinese regionals**	3671/1471V	2	3/4	8(.932)	New 07-06, Yanbian, Jilin Satellite TV
	CETV digital	3680/1470H	1+ TV	3/4	26(.670)	replaces analogue same freq, V33, A32
	Zee bouquet	3700/1450V	10TV	3/4	27(.500)	Now SECA 2 CA (10-04), Radio Aust Eng A2011
	Ch News Asia	3706/1444H	1TV (+)	3/4	6(.000)	English + V1160, A1120, 525, 625 versions
	Azio TV	3716/1434H	1TV (+)	3/4	7(.000)	Was parallel to 3640Hz analogue (now gone)
	BTV World	3725V//1425V	1TV	3/4	4(.450)	
	TVB 8	3729/1421H	1TV	3/4	13(.650)	
	Zee Movies	3732/1418V	3TV	3/4	6(.500)	Conax CA, all Hindi films
	Fashion TV	3745/1405V	1TV	3/4	2(.625)	new frequency October 2005
	AAJ-TV	3750/1400V	1TV	3/4	2(.820)	New April 2005, English, urdu
	Arirang TV	3755/1395V	1	7/8	4(.418)	FTA SCPC, New PIDs V3601, A3606 June 2003
	New TV +	3760/1390H	up to 10TV	7/8	26(.000)	CA + 10 **FTA**, DW, TV5, Al Jazeera English
	Star TV	3780/1370V	7(+)TV	3/4	28(.100)	NDS CA (Pace DVS211, Zenith)
	Pakistan	3786/1364H	2TV	3/4	5(.700)	
	WIK Kids	3792/1358H	1TV	3/4	3(.000)	
	Eurosport Pacific	3816/1334H	1TV	3/4	2(.515)	CA Subscriptions reportedly available
	Star TV	3840/1310H	7(+) TV	7/8	26(.850)	NDS CA (Pace DVS211, Zenith)
	Star TV	3860/1290V	5(+)TV	3/4	27(.500)	NDS CA (Pace DVS211, Zenith)
	Star TV	3920/1230H	4+ TV	7/8	26(.850)	NDS CA (Pace DVS2111, Zenith)
	CNNI	3960/1190H	8TV, 1 radio	3/4	27(500)	PowVu CA, new SR Apr 29, CNN radio **FTA**
	StarTV	3980/1170V	6+TV	3/4	28(.100)	NDS CA, Star News India **FTA** VPID 514, APID 648
	Star TV	4000/1150H	8(+)TV	7/8	26(.850)	NDS CA w/ **4(Chinese) FTA**
	Sahara digital	4020/1130V	8TV, 1 radio	3/4	27(.250)	New Sr September 2004
	VOA Pacific/Asia	4040/1110H	1TV, 20+ radio	1/2	20(.400)	New January 2008; multiple audio channels
	Pakistani TV	4091/1059V	4TV, 1 radio	3/4	9(.330)	new Sr, channels. April 2006
	Sun TV	4095/1055H	1	3/4	5(.554)	"History Channel" - SCPC, some English
	PTV Global	4102/1048V	1	3/4	2(.894)	
	PTV National	4112//1038V	1TV, 1 radio	3/4	9(.333)	
	TVB8 Mux	4111/1040H	4 TV	3/4	13(.650)	
	Zee Bqt #2	4140/1010V	8(+) TV	3/4	27(.500)	Now SECA 2 CA (10-04), 1 occ FTA (varies)
Cak1/107.5	Indovision (S-band)	2 535, 2 565, 2 595, 2 625, 2 655	33(+) TV	7/8	20(.000)	NDS CA using RCA/Thomson, Pace IRDs; **2.535 has 2 FTA.** Bird now inclined
T.Konv108E	**IndoBqt**	3460/1690H	up to 6	3/4	28(.000)	also 3586H/17.500, 3496H/19.615
C2M/113E	**TPI**	4185/965V	1	3/4	6(.700)	FTA SCPA, NT/NC only
	Anteve	4144/1006V	1	3/4	6(.510)	change from 4055V, FTA SCPC
	Kabelvision Mux	4080/1070H	7+ TV	7/8	28(.125)	also try 3500H, 27.000, 3/4, strong NZ
	Indostar	4074/1076V	1	3/4	6(.500)	New (but probably temporary) 07-06
	SCTV	3934/1216H	1	3/4	6(.620)	**FTA**, may not be active full time
	Indo MUX	3880/1270H	3+ TV	7/8	28(.121)	**FTA**; Sr change 01/03, erratic
	KBS World	3838/1312V	1TV		2(.100)	New August 2007, note low res rate
	TVRI	3765/1385H	1TV	3/4	5(.555)	bounces btwn FTA and CA, unreliable (12-04)

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Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
	SCTV	3726/1424V	1TV	3/4	6(.620)
	RCTI	3473/1677H	2	3/4	8(.000)
C6B/115	**See**	SF#156	p. 29	for interim	update
As4/122	**CCTV MCPC**	3820/1330V	8	3/4	27(.500)
Sin3/125	**Tests**	3989/1161H	1	3/4	9(073)
Jc3/128	Miracle Net	3996/1154V	3 up to 6	5/6	22(.000)
	Asian bqt	3960/1190V	up to 8	7/8	30(.000)
Ap6134E	Multiple	4140/1010V	up to 8	7/8	27(.500)
T18/138	**Tests**	3460/1690V	8	3/4	30(.000)
MeasSs2	**Astro Mux**	11.602H	up to 17TV	3/4	41(.500)
D2/152	**7 Cent. Feed**	12.310H	1TV	3/4	5(.100)
	AuroraBiz	12.407V	4 TV, 10 radio	2/3	30(.000)
	UBI	12.394H	13 TV + 13 radio	3/4	22(.500)
	UBI	12.421H	13 TV	3/4	22(.500)
	Globecast #5	12.518V	12 TV, 1 data	3/4	22.(500)
	ABC Feeds	12.538H	1 TV per SCPC	3/4	6(.980)
	UBI	12.581H	13 TV, radio	3/4	22).500)
	UBI	12.608H	13TV, 13 radio	3/4	22(.500)
	UBI	12.644H	13TV, 13 radio	3/4	22(.500)
	Globecast #1	12.644V	12TV, 14 radio	3/4	22(.500)
	Globecast feeds	12.660V +	1TV	3/4	6(.670)
	UBI	12.671H	13TV, 13 radio	3/4	22(.500)
	Globecast HD	12.675V	1TV	3/4	13(.330)
	Globecast #3	12.706V	13TV, 6 radio	3/4	22(.500)
	Globecast #2	12.733V	12TV, 10 radio	3/4	22(.500)
C1/156E	Aurora	12.324V/T1U			
	Pay TV	12.365V/T2	11TV, 2 radio	3/4	27(.800)
	Aurora Home	12.407V/T3	5 TV, 13 radio	2/3	30(.000)
	Pay-TV	12.447V/T4	5TV, 4 data	3/4	27(.800)
	Pay TV	12.487V/T5	3+ TV, data	3/4	27(.800)
	Aurora 2	12.527V/T6	7TV, 20 radio	3/4	30(.000)
	Pay-TV	12.567V/T7	10 TV	3/4	27(.800)
	Pay-TV	12.607V/T8	10 TV	3/4	27(.800)
	Pay-TV	12.647V/T9	10 TV	3/4	27(.800)
	Foxtel HD	12.688H	3TV (?)	3/4	27(.800)
	Pay-TV	12.692V/T10L	6TV, 27 radio	1/2	28(.650)
	Aurora MUX	12.728V/T10U	4TV, 17 radio	1/2	24(.450)
	Austar	12.305H/T11	6TV, 24 data	3/4	30(.000)
	Pay-TV	12.358H/T12	10 TV	3/4	27(.800)
	Pay-TV	12.398H/T13	10 TV	3/4	27(.800)
	Pay-TV	12.438H/T14	6TV, 3 data	3/4	27(.800)
	Pay-TV	12.478H/T15	10 TV	3/4	27(.800)
	Pay-TV	12.518H/T16	10 TV	3/4	27(.800)
	Pay-TV	12.558H/T17	10 TV	3/4	27(.800)
	Pay TV	12.598H/T18	10 TV	3/4	27(.800)
	Pay-TV	12.638H/T19	10TV, 30 radio	3/4	27(.800)
	Pay TV	12.688H/T20	11TV	3/4	27(.800)
D1/160E	Sky NZ test	12.394H	TV +	3/4	22(.500)
	SBS west	12.407H	TV+	5/6	12(.600)
	WIN + GWN	12.424H	2TV		14(.294)
	Freeview NZ	12.456H	TV+	3/4	22(.500)
	Sky NZ	12.519H	TV+	3/4	22(.500)
	Sky NZ	12.519V	TV+	3/4	22(.500)
	ABC NSW	12.514H	TV	7/8	14(.294)
	ABC South	12.532H	TV	7/8	14(.294)
	ABC Northern	12.550H	TV	7/8	14(.294)
	ABC Western	12.577H	TV	7/8	14(.294)
	ABC Victoria	12.595H	TV	7/8	14(.294)
	ABC Qld	12.613H	TV	7/8	14(.294)
	Austr Mux	12.643V	TV, radio, data	3/4	6(.874)
	Feeds	12.670V	TV	3/4	6(.670)
I8/166E	SelecTV	12.526H	8+TV	3/4	28(.800)
	CCTV	12.557H	3+TV	3/4	13(.240)
	ABS-CBN	12.575H	4+TV, 4+ radio	2/3	13(.845)
	MYSAT	12.646H	up to 8 TV	3/4	28(.066)
	JEDI/TVB	12.686H	11+ TV	3/4	28(.126)
	PnGlobal Aust	12.726H	6+TV	3/4	28.(066)
	ABC A-P	4180/970H	2TV, 2 radio	3/4	27(.500)
	Disney Pac	4140/1010H	typ 6 TV	5/6	28(.125)
	NHK Joho	4060/1090H	7TV, 1 radio	1/2	16(.180)
	FOX Mux	4040/1110V	up to 5TV	7/8	26(.470)
	NET +	4121/1029V	1 TV	3/4	4(.774)
	ESPN USA	4020/1130H	8+TV, data	3/4	26(.470)
	Discovery	3980/1170H	8 typ.	3/4	27(.690)
	CalBqt/Pas8	3940/1210H	up to 3+ FTA	7/8	27(.690)
	CNBC HK	3900/1250H	up to 7TV	3/4	27(.500)
	FilipinoMUX	3880/1270V	up to 8TV+radio	5/6	28(.694)
	CCTV Mux	3829/1321H	up to 4 + 1 radio	3/4	13(.240)
	TVBS-N	3836/1314V	**IFTA**, 4+ CA	3/4	17(.500)
	EMTV PNG	3808/1342V	1 + 2 radio	3/4	5(.632)
	CNNI	3780/1370H	3, up to 5 TV	3/4	25(.000)
	Discovery Asia	3764/1386V	Up to 6 TV	3/4	19(.850)
	MTV	3740/1410H	8	2/3	27(.500)
I2/169E	WA Mux Pv	12.281V	3+ TV, radio	2/3	27(.500)
	Ariang TV	12.401V	1TV	3/4	4(.400)
	ABS-CBN	12.575H	4TV, 2 radio		13(.845)
	Test mux	12.715H	6+ TV	2/3	30(.000)
	TARBS feeds	4090V/1060V	9TV + radio	3/4	21(.000)
	BBC SCPC	3986/1164H	1TV	1/2	5(.700)
	Middle East	3836/1314V	4 typ	3/4	13(.331)

Receivers and Errata

was on 4048V, New Caledonia, parts of Australia
FTA SCPC;or, 3774H, 6.520, ¾ (June 06)
Services/bird new August 1, 2007
also: 3820V, 3940V,4100Vin blindscan
Tests, coverage unknown, Hz only? 09/07
PowerVu, some FTA (Ch 1 & 3)
CA & FTA NTSC Japan, Taiwan
scan 3500-4200 V+H, analogue 3860V
also try 3660/3540VVt, Sr 30 000, 3/4; some FTA
Aust East beam - 3 **FTA** + 14 CA
D2 replaced B3 22 January 2008
differs from 12.407 C1; tune FTA ch, NZ + Au
Feb 2008, NZ + Australia
Feb 2008, NZ + Australia, 2 FTA
New Dec 2007, up to 4 FTA
also 12.545, 12.555Hz (news feeds)
All CA
New Dec 2007, **ERT, KTV, SCTV FTA**
Feb 2008, NZ + Australia
New Dec 2007, many FTA
also 12.670V, 12.680V
Feb 2008, NZ + Australia
Data rate 17.358 MBit/s (Feb 2008)
New Dec 2007, many FTA
8 FTA TV, NHK English added Feb 08
not currently in use
Tests, SBS-NDS CA, others FTA when here
NZ (90cm) + Australia **(Only C1 svc left on NZ)**
Australia NA only (leakage to Norfolk, New Cal)
Australia NA only (leakage), 9-Net x 3 widescreen
Arrow radio (still here), tone FTA
Pay-per-view movies, CA
Pay-per-view movies, CA
Pay-per-view movies, CA
HD testing, CA
ABC for Foxtel/Austar, previously 12.288V
changes September 2005
Austar inter, **Expo FTA**
NDS CA + Mcrypt, CA
CA, subscriptions available Australia, Norfolk
Sky News active, 'Help x 2' **FTA**
CA, subscriptions avail Au, Nrflk, **TVSN FTA**
CA, subscriptions available Australia, Norfolk
"Home"CA, subscription available Australia, Nrflk
CA, subscriptions available Australia, Norfolk
CA, subscription available Australia, Norfolk
CA, subscription available Australia, Norfolk
+12.451H/SE, 12.469H/Qld, 12.487H/south
Previously B3, 12.737V (Dec 2007)
+12.483H
+12.546, 581, 608, 644, 671.707, 734(all H)
Australia + NZ beam, SKY tests
Australia only
Australia only
Australia only
Australia only
Australia only
Australia only
Dual beam (Australia & NZ), V8 other feeds 08/07

& 12.286, 12.326
FTA-Australia
CA -Australia
FTA V=5340, A=790 -Australia
June 2002-Irdeto-2 CA - Australia
Some **FTA**-Australia
Dateline west, also east PAS2, 3901V

PowVu CA
PowVu CA & **FTA**, sub available-changes 05-06
was PAS-2, previously 3992Vt, **feeds FTA**
NET25 + FTA; new PIDS April '03, reload
PowVu CA, ch 11 DCP-CCP bootload, audio **FTA**
PowVu/CA (some audio **FTA**)
PowVu CA **& FTA (EWTN + CBS +TBN +)**
NDS CA (6 channels), one test card occ FTA
Myx FTA V1960, A1920 + radio FTA
PowVu FTA, replaces PAS-2 svc
CCTV cross pole, new SR 04-06
PowerVu CA
PowerVu, some audio **FTA**
PowerVu, Asian MUX, new parameters Nov '03
 # 8 MTV China FTA V289, A290; rest CA
PowVu CA, WIN, ABC NT, SBS, status unknown
Test - may not stay permanently
Temp **FTA**, subs Aust 011-800-2270-0722
initially with 6 NTSC colour bars
Occ **FTA** (Chile +), BIG power reduction Nov 03
BBC World moved here January 2005
Subscriptions available, Strong Technology

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
(PAS2/169E)	**Adventists.tv**	4040/1010H	1	2/3	5(900)
	Feeds	3868/1182H	1	2/3	6(620)
	Feeds	3939/1211H	2 (typ NTSC)	2/3	6(620)/7(498)
	Cal PowVu	3901/1249H	up to 8	3/4	30(800)
	HK bouquet	3850/1300H	up to 8	2/3	24(900)
	Korean Bqt	3771/1379H	1	3/4	6(510)
AMC23/172E	**Various-tests**	12 730H	up to 8	3/4	30(000)
1804/174E	**iPSTAR**	12 619H	1	2/3	25(220)
	Tests-NZ beam	12 646H	1	3/4	22(418)
	RFO Poly	4027/1123R	1TV	3/4	4(566)
I70I/180E	TNTV	11 060&11 514V	9	3/4	30(000)
	TVRFO	11.136V, 11.174V	6+TV, 3+ radio	3/4	23(149)
	Canal+Sat	11 610H	16TV, 1 radio	3/4	30(000)
	PBS	12 648HH	16TV possible	3/4	28(066)
	TVNZ/BBC	4186/964RHC	1	3/4	5(632)
	TVNZ	4178/972RHC	1	3/4	5(632)
	AFRTS DTS	4175/975L	3 TV, 3 radio	2/3	3(680)
	TVNZ/Aptn	4170/980RHC	1	3/4	5(632)
	Fiji Sky Pacific	4095/1055LHC	6TV + future radio	3/4	16(505)
	Fiji Sky Pacific	4055/1095LHC	7TV + future radio	3/4	16(505)
	TVNZ/feeds	4052/1098RHC	1	3/4	5(632)
	TVNZ feeds	4044/1106R	1	3/4	5(632)
	NBC to 7 Oz	3960/1190R	1	7/8	6(447)
	TBN Mux	3927/1223R	4TV	2/3	11 (394)
	Ioarana	3772/1378L	1	3/4	4(566)
	NASA TV	3854/1296R	1 TV	3/4	2(000)
	TVNZ	3846/1304R	1	3/4	5(632)
	USA feeds	3749/1401R	4?	?	26(400)
NSS-5/177W	Pacific IP Data	3763/1387R	none-data	3/4	27(500)
	RFO/Tempo	3920/1230R	1	3/4	2(893)
	Wallis/Futuna	3922/1228L	1		2(895)
	BYU-TV	4185/965R	1TV, 20+ audio	1/2	6(525)
	Australia Temp.	12 522V	8 SCPC	7/8 & **5/6**	14.294 & **12.600**
	iPSTAR Tests	12 691V	8 TV	5/6	17(600)

Receivers and Errata
New December 2003, 24/7 "Hope Chs "
FTA (occ sport), also try 3863,Sr6 100
FTA-typ NTSC-occ sport, live Shuttle
PowVu CA + **FTA**(includes BBC-W 05-05)
was 4148Vt, some **FTA**
Korean MUX, reload 12-04, new Sr
Testing on NZ/East Australia beam
Tests, late May start, also 12 646H
Testing possible data links, June 2003
SE spot beam, was 4027LHC
east spot, 10TV + r each, vertical pol
FTA 11.136 Tahitian beam, 11 174 west beam, 12/04
1+ **FTA**, MediaGd "2", + 10 975 weaker
Testing Fiji region pay-TV (MDS) package (Oct '04)
DMV/NTL early vers .occ feeds, typ ca
DMV/NTL early vers., occ feeds, typ ca
'DTS Direct to Sailors; audio previously FTA - gone
DMV/NTL early vers. occ feeds, typically ca
Nagravision CA (Feb 1, 2005) New PIDS
All now (including Fiji 1) CA, 7 Feb, 2005)
DMV/NTL early vers ,occ feeds, typ ca
SCPC, mixed CA and **FTA** feeds
CA, Leitch encoded
January 2006-now 4 channels, new Sr
FTA SCPC, East Hemi Beam-Tahiti
24/7 live NASA - West Hemi bm (can be difficult!)
SCPC, mixed CA & **FTA**, feeds
16-QAM (not MPEG-2 compatible)
Data only but useful for dish alignment
Wallis & Futuna Island(s) service
Outward bound W & F
Global beam - requires sizeable dish
Aust beam: 12.522, 538,555,574,604,**621**,**639** & **657**
CA Tests - Taiwan TV: data coming?? (NZ beam)

MPEG-2 DVB Receivers: (Data here believed accurate; we assume no responsibility for correctness!)

AV-COMM R3100. FTA, excellent sensitivity (review SF May 1998); new version Sept. '99. **AV-COMM P/L**, 61-2-9939-4377.
AV-COMM Tiny Tot. FTA, 12Vdc operated, palm sized, low power consumption; review SF#120. Contact # above.
Coship 3188C. Review SF#107. Blind search FTA rcvr; works well. Phoenix Technology Group (www.phoenixsatellite.com.au) (Irdeto 2 as well as FTA versions)
Coship FTA, CA, HDD. Review SF#143, state of art functions, blind search. Phoenix (above), Satlink NZ, fax 64-9-814-9447;
Divitone: "Left-handed" review SF#115; does "code key" entry. Available http://www.satmax.ws
eMTech eM-100B (FTA), eM-200B (FTA + Cb2), eM210B (FTA + 2xCI + positioner); KanSat 61-7-5484 6246 (review SF#89)
eM-150/Homecast. FTA + embedded multi-format, review SF#144. Sciteq (61-8-9409-6677) and Kristal (61-7-4728 7704)
Fortec Star Lifetime. Two versions, both blind search, code-key programmable, one X 2 CI. Review SF#119. www.aDigitaLife.com
Homecast (em-150, eM-1150, eM-2150) series of FTA, CA, HDD sate of art STBs, review SF#144. Sciteq (www.sciteq.com.au)
Humax ICRI 5400 (Z). Embedded Irdeto + 2 CAM slots; initial units had NTSC glitch, now fixed. Widely available; new software avail 04-04, SF#76.
Humax IRCI 5410 (Z). Adaptable version capable of holding multi-CA systems (SF#98, 99). Widely available; original importer Sciteq (www.sciteq.com.au).
Hyundai-TV/COM. HSS100B/G (Pacific) FTA. Different software, 2.26/2.27 good performers, 3.11 and those with Nokia tuners also good; later 5.0 not good.
Hyundai HSS700. FTA, PowerVu, SCPC/MCPC. Review SF March 1999. Kristal Electronics, 61-7-4788-8902.
Hyundai HSS800CI. FTA, Irdeto (with CAM) + other CA systems, PowerVu, NTSC. Kristal Electronics, above; review SF#63.
INNOVIA IDS3088. Review SF#111. Blind search FTA receiver. High quality IRD; available Phoenix TechnologyGroup, and Satmax (http://www.satmax.ws).
KAON KSF-2000/KPSF-200FTA receiver dynamic channel update/Freeview channel mapping. Asoft Ltd 64-4-234-1096.
KAON KSF-620R2 Multiroom FTA receiver Dynamic Channel update/Freeview channel mapping. ASoft Ltd. 64-4-234-1096.
KAON KSC-N550H2R new 160Gb Premium Dual PVR with analogue input. Asoft Ltd 64-4-234-1096.
ID Digital CI-24 Sensor. New August 2003; new lower noise tuner, extra sensitivity; CI Interface slot Irdeto 1 & 2; review SF#109. Sciteq 61-8-9409-6677.
MediaStar D7.5. New (May 00) single chip FTA; review June 2000 SF. MediaStar Comm. Int. 61-2-9618-5777 (www.mediastar.com.au)
MediaStar D10. FTA and Irdeto embedded CA. VG receiver; see review SF#96, August 2002. Contacts immediately above.
MultiChoice (UEC) 660. Essentially same as Australian 660, not grey market contrary to reports. Sciteq tel 61-8-9306-3738
Nokia "d-box" (V1.7X). European, FTA, may only be German language, capable of Dr. Overflow software. SF#95, p. 14.
Nokia 9200/9500. When equipped with proper software, does Aurora, originally did pay-TV services provided software has been "patched" with "Sandra" or similar program. See SF#95, p. 14, SF#96 p. 15. SatWorld 61-3-9773-9270 (www.satworld.com.au)
Pace DGT400/DVR500. Originally Galaxy (Now Foxtel+Austar). Irdeto, some FTA with difficulty (Foxtel Australia 1300-360818). UECs replaced.
Pace "Worldbox" (DSR-620 in NZ). Non-DVB compliant NDS CA including Sky NZ, no FTA; similar "Zenith" version (see SF#115, p. 15).
Phoenix 111, 222, 333 models (no longer produced): Service, backup - Phoenix Technology Group 61 3 9553 3399; www.phoenixsatellite.com.au
Pioneer TS4. Mediaguard CA (no FTA), embedded Msym, FEC, only for Canal+Satellite (AntenneCal ++687-43.81.56)
PowerVu (D9223, 9225, 9234). Non-DVB compliant MPEG-2 unless loaded with software through ESPN Boot Loader (see below). Primarily sold for proprietary CA (NHK, CMT etc). For service only - call Scientific Atlanta 61-2-9452-3388. For revision model D9850, see Scientific Atlanta (below).
Prosat 2102S. FTA SCPC/MCPC, NTSC/PAL, SCART + RCA. Sciteq 61-8-9306-3738.
SatCruiser DSR-101. FTA SCPC/MCPC, PowVu, NTSC/PAL. (Skyvision Australia 61-3-9888-7491, Telsat 64-6-356-2749); no longer available)
SatCruiser DSR-201P. FTA SCPC/MCPC, PowVu, NTSC/PAL, analogue, positioner - (Skyvision - see above); no longer available.
SATWORK ST3618. Blind search FTA receiver. Fast search, problems, especially in "memory-filing" system; review SF#111. Available DMSi at tim@dmsiusa.com.
SATWORK ST3688. Blind search, 3000+ ch memory, multi-format RF modulator, improved version 3618. Review SF#113; available DMSi (above).
Scientific Atlanta D9223, D9234, D9225; Orig. PowerVu, superceded Dec 2003 by D9850. Commercial receiver, available TVO 61-2-9281-4481, John Martin
Strong Technologies SRT2620. SCPC, MCPC FTA, exc sensitivity, ease use, programming. Review SF#91 (ph. below).
Strong 3650. Budget priced entry level SCPC, MCPC new late 2007; review SF#160 (ph. below)
Strong SRT 4600 SCPC, MCPC, PowerVu; exc graphics, ease of use, review SF#64. Strong Technologies 61-3-8795-7990.
Strong SRT 465_X (range) New mid 2007, Conax + Irdeto CA; review SF#156. Receivers state of art, above average sensitivity. USB, blind scan (ph. below)
Strong 4800. SCPC, MCPC, embedded Irdeto+ CAM slots, does code-key with additional software, Aurora. Strong Technologies 61-3-8795-7990.
Strong 4800 II. SCPC, MCPC CAM slots x 2 for Aurora +, Zee, Canal +, code key with additional software. Strong Technologies (above); review SF#103.
Strong 4890. SCPC, MCPC, 30Gb PVR, 2 CAM slots, DiSEqC 1.0, 1.2 (review SF#84), does code key with additional software; Strong Technologies, # above.
Strong 4892/4990 (new 2007). Latest technology MPEG-2;
UEC Atlas/Titan (1000). New July 2003, replacing DGT400 for Austar. No SCART, L-band loop; also available Rural Electronics 61-2-6361 3636.
UEC642. Designed for Aurora (Irdeto), approved by Optus; w/new software, C-band FTA; faulty P/S. Norsat 61-8-9451-8300.
UEC660. Upgraded UEC642, used by Sky Racing Aust., Foxtel,limited FTA. (Nationwide - 61-7-3252-2947); P/S problems.
UEC700/720. Single chip Irdeto built-in design for Foxtel; unfriendly for FTA. Power supply problems, seldom sold to consumers; propensity to fall off back of trucks.
"X" Digital. When modified with "aftermarket" Internet softwre, does Aurora and other V-1 CA without card; review SF#119. Strong Technologies (61-3-8795-7990)
Zinwell ZMX-7500. Approved NZ Freeview, through authorised dealers; review SF#150; some unresolved technical issues as of June 2007.

Accessories:

Aurora smart cards. MCRYPT (Irdeto V2) cards now available (Jan 2005), Sciteq 61-8-9409-6677.
PowerVu Software Upgrade: PAS-8, 4020/1130Hz, Sr 26.470, 3/4; pgm ch 11 and follow instructions (do not leave early!)
PowerVu (Pacific) **repair service**: Cable & Sat Svcs, Darius West, 61-2-9792-1421 (Email darius@cases.net.au)

WITH THE OBSERVERS

AT PRESS DEADLINE

Freeview considering pay-view? TV3 proposal now being studied - adding movie or sports channel but for pay, not free. And the smartcard goes where? Check www.spacemart.com/reports/Satellite for link to 'Satellite and WiMax spectrum sharing; see p. 7.

Scheduled launches: April 10/rescheduled Vinasat to 132E; 12Ku, 8 C. April/ApStar 6B; 4Ka, 18Ku, 28C - replacement for ApStar 6? April-End/ Chinasat 9 to 134E; 22Ku.

AsiaSat 2/100.5E: "Kuwait Space Channel is now (FTA) available on 3820Vt (Sr27.500, 3/4)." (**NS**, Vic)

Optus B3/164E: Ex 152E now stationary in this new location; no operational plans announced.

Optus C1/156E: "Back in September (2007) ABC SE VPID was changed. Now it is back to VPID 768 but a new PCR PID of 128 (normally, PCR and video are same). " (**Andy**) "On 12.407Vt 'Info 156E' Optus has added a single page advert for 'Optus Broadband Satellite' but the offer is only good until 31 March. This is the Government subsidy program where qualified households receive $2,750 for the satellite equipment and installation." (**IF**, Qld) "Foxtel HD tests continue (12.688Hz) - 3 real channels plus several 'fake channels' load; CA of course. On 12.438Hz (T14), a new channel labelled xPUSH AVC SD' has been added (VPID 1121, APID 1122, AC3 1124). This is CA but appears to be test of MPEG4 SD. At same time T14's 'iEPG Video Satellite' (VPID 1081, running at 1 MBit/s) has been taken off. This was a graphic 'skin' (background) for Foxtel's EPG on some receivers. And, the bulk of the Foxtel/Austar ABC TV channels have been relabelled as 'ABC1' as have the terrestrial ABC channels. Aurora, unlikely to ever had ABC2 or ABC3, has not added the '1' to their labelling." (**AI**, NSW)

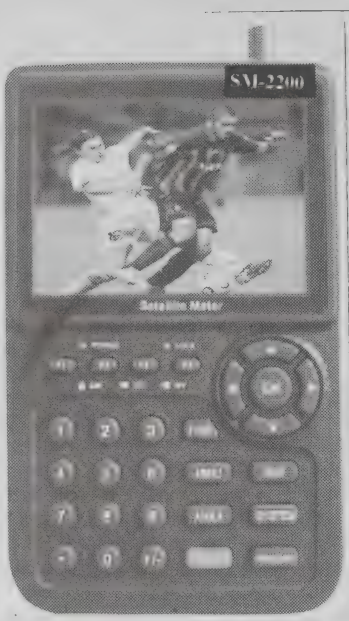
Optus D2/152E: "Correction from SF#161. ABC news feeds (continue to) use 12.538, 12.545 and 12.555Hz; all Sr 6.980, 3/4. The (p. 23) list attributes the TVN feed as (12.660V etc.) as ABC; not so. Globecast continues to use 12.660, 12.670, 12.680Vt (Sr 6.670, 3/4) for SCPC SD feeds. In February, they were running HD on 12.675Vt Sr 13.330, 3/4 with a video data rate of 17.358 MBit/s. This was in CA using but the DVB2000 software (in Nokia) could not recognise the format." (**IF**, Qld.) "Polsat (12.518Vt) has gone CA as predicted in SF#162, p. 25. At same time the 'spare' channel (12.518) at VPID 5112, APID 5212 became 'Al Hayat' - an Arabic language Christian channel (to remain FTA). Late in February the 12.733Vt channel (VPID 2101, APID 2201) labelled 'Deepam' switched to 'NHK World TV' and is currently FTA with stereo English audio tracks." (**AI**, NSW) (Editor's note: This one has announced intent to stay FTA which will be good news for motels, hotels catering to Japanese tourists.) "UBI's 'Info Channel' is currently running a trio of adverts including (1) availability in NZ (0800400023), (2) a free month for current subscribers who entice a friend to join UBI, and, (3) ETIHAD airways promotion. In mid-February 12.608Hz dropped the 'CINL' (Cinema Latino) service; channel relabelled 'C105' but no data stream flowing." (**IF**, Qld.) "Sky Australia's new 'SKY 10' service (12.407Vt) - 'The Oracle-Tipping'- has become CA but no apparent programming as data rate is constant 1.5 MBit/s." (**AI**, NSW)

Soapbox: "Sony wins, Toshiba loses. Toshiba's HD-DVD disc system has thrown in the towel, relinquishing the exclusive rights to HD DVDs to Sony's Blu-ray format. Toshiba won an earlier battle (the original one for DVD), but the Blu-ray format has managed to gain support from movie makers and through the (Sony) PS-3 Playstation, a slight lead in world-wide acceptance. HD-DVD discs are now collector items, along with the very limited production of HD-DVD players." (**Sanjo**, Tokyo) "ABC Australia is now heavily promoting that it transmits multiple (digital terrestrial) TV channels. The ABC logo on the original ABC channel has been replaced with 'ABC1' and programs for ABC2 are now promoted on ABC1. ABC2 is now doing 'Movie Night' on Saturdays and following a barrage of complaints concerning the size and placement of the 'ABC2' channel logo, it has been modified to be smaller and more transparent." (**IF**, Qld.) "US$40 coupons, which are actually one-time use cash cards,

Freeview New Zealand Updates

For satellite viewers, TVNZ7 is scheduled to launch 30 March within the (12.456Hz) MCPC MUX. The channel will feature 'frequent news updates', at least hourly for daylight and evening hours, and programming described as '70% New Zealand origin'. On or about 1 April, Freeview terrestrial will kick off (although service is already functioning - see p. 2 here). A second Maori channel is also scheduled to begin broadcasting at about the same time. Early promotion by chain stores suggests the all-imperative DTT-HD set top box will retail in the region of NZ$500 but as we have all been aware for some months, unless the home also has a compatible HDMI/HDCP display system (receiver) the reception will be limited to SD through composite outputs. Programme channels available through DTT will not necessarily also be available on DVT-S (satellite). HD (high definition) will be limited to terrestrial Freeview which is broadcasting in the UHF band for the ten largest population centres only.

WITH THE OBSERVERS: Reports of new programmers, changes in established programming sources are encouraged from readers throughout the Pacific and Asian regions. Information shared here is an important tool in our ever expanding satellite TV universe. **Photos of yourself, your equipment** or off-air photos taken from your TV screen **are welcomed**. TV screen photos: If PAL or SECAM, set camera to f3.5-f5 at 1/15th second with ASA 100 film; for NTSC, change shutter speed to 1/30th. Use no flash, set camera on tripod or hold steady. Alternately submit any VHS speed, format reception directly to SatFACTS and we will photograph for you. Deadline for April 15th issue: April 3rd by mail or 5PM NZT April 4th if by fax to 64-9-406-1083 or Email skyking@clear.net.nz.



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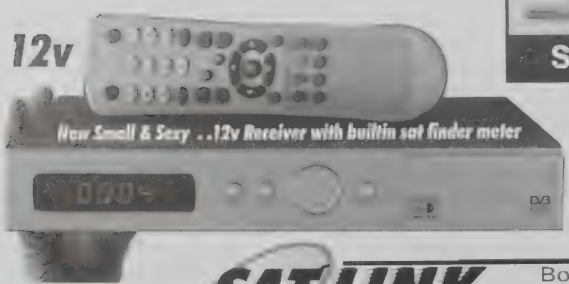

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allowing consumers to select from a variety of DTT boxes to assist in converting from analogue to digital reception are now arriving in millions of mailboxes nation-wide. The cards can be spent as a $40 'bonus' for any digital TV reception product and while a few of the low end DTT set top boxes are in fact priced at $40, the majority are as much as twice that number. A Zenith/LG model is especially highly rated and very popular initially. Alas, these are all SD version output boxes - anyone who is going for a HD version box will be spending hundreds of dollars for the STB. But then - if you wanted HD, the better option is an ATSC format receiver with built-in tuner, eliminating the need for the STB. Bottom line? HD version STBs are not going to find a very big market in North America." (**William T**, San Francisco) (Editor's note: In fact the 'rules' governing the use of the $40 coupons state they may be used only for acquiring SD output boxes - no HD.) "Holdout 7 Network, previously missing from the Foxtel package, will now join Ten and 9 (plus SBS and ABC). The war is apparently over." (**CG**, Sydney) "Rumour of the month: UEC's South African built Austar STBs have NDS software built-in. And this has come as a total surprise to officials at Austar who are trying to work out how this happened and what it means. NDS has struck again?" (**RD**, South Africa) "German firm Premiere, using the Nagravision CA system, has been hacked and the German channel reportedly is bringing suit against NDS whom the suit charges facilitated the hack. This would not be the first time that one programmer or encryption firm has hacked a competition for the purpose of reducing their value in the marketplace." (**MM**) (Editor's note: And it fits - see page 16 here.) "SF#161, p. 27, discussed possibility of HDMI leads acting as transmission (or reception) antennas creating interference for other consumer electronic products. I note a 5m monster HDMI cable in a local shop which has huge ferrite-beads at both ends. The cable itself is very heavy and there is little doubt why non-secured HDMI connections will by gravity fall out of chassis connection points. I have also seen PAL fly-leads with ferrite beads - again, to stop interference. " (**NS**, Victoria) (Editor's note: Ferrite beads are commonplace in the computer world - they act as an 'RF choke' to magnetically absorb radio frequency signals which are flowing on the wires or harnesses they surround. Beads are measured by the frequency range over which they work [such as 1-30 MHz] and the degree or level of signal absorption [attenuation; such as -30 dB]. However, in any given installation the frequency range absorbed and/or the attenuation may not fit the circumstances requiring additional beads and their careful fitting. By placing one set at each end of a cable, in theory the wire between the two beads is 'RF isolated' and will not receive enough EMI [electromagnetic interference] to radiate into the air. If you get involved in beads, study the frequency and attenuation specs before selecting a product.)

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Since late 2004 broadband interference in the C-band satellite spectrum has been ever present in the Sydney metropolitan area wiping out an estimated 10,000 C-band viewers as well as many commercial sites. This interference caused by Unwired Australia has now spread to Melbourne. To fight this interference, Av-Comm has designed a range of products to allow customers to continue using C-band systems.

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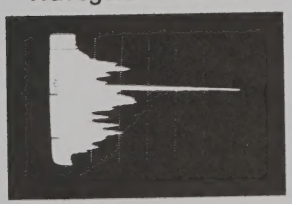
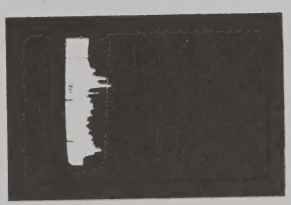


Spectrum Showing Unwired



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As each site that suffers interference is different, there is no one fix for all affected sites but over the past two years we have developed many combinations to give you the best chance of beating this problem. Our commercial solutions have a 100% success rate. If you are experiencing problems caused by interference feel free to call us and we will help find the best solution for you.

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❑ **C-BAND Remembered**: More than 30 "stories" by the pioneers of home satellite reception. It was an era never to be repeated - American technology that reduced the cost of a (C-Band) home dish from $15,000 to under $1,000 in just two years, turning home dish reception into an international system. Coop asked 30 pioneers for their reflections on what they did, why, when and where and this unusual book tells it all. A gentle read, approximately 200 pages in writer-chapter form plus 32 pages of full colour illustrations from the 1980s era. (First printed 2007) US$20 (includes postage inside of USA), Au$23 plus shipping from New Zealand, NZ$27 (includes shipping inside of New Zealand).

❑ **SatFACTS Anthology**: Issues 1 through 156 (the first 13 years!) on CD/DVD. Nearly 5,000 pages of *SatFACTS* - from the first appearance of home satellite dishes in the Pacific through August 2007. The genuine material as it happened, right their on your PC screen (requires Acrobat Reader software to be used). US$40/Au$45/NZ$53 postage paid.

❑ **CATJ-CSD Anthology**: 1974 through 1987. Before there was SatFACTS, back in the US of A, from 1974 through 1979 Coop created CATJ (*Community Antenna Television Journal*) and from 1979 through 1987 CSD (*Coop's Satellite Digest*). This spans the full era from before satellite to the end of C-Band as America had grown to love it (from no home dish systems in 1978 to more than 3 million in 1987!). More than 10,000 pages (!!!) of as it happened - warts and all. This is the bargain of all bargains - US$30/Au$38/NZ$47 includes postage.

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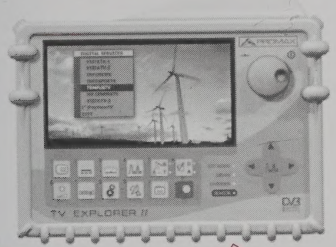

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